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UNITED STATES AIR FORCE
AFIOH

AGE Bio Diesel Emissions Evaluation

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December 2003

Approved for public release;

distribution is unlimited.

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Risk Analysis Directorate
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This report serves as the findings of a field study to determine the emissions from internal combustion engines burning B20 Bio Diesel. B20 contains approximately 20% soybean and 80% diesel fuel. Bio Diesel was used as fuel in an AM32A-86D generator and a NF2 light unit. Air pollution emissions and operational data were gathered on each unit at various power settings.

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ACRONYMS

AFB	Air Force Base
AFIERA	Air Force Institute for Environment, Safety, and Occupational Health Risk Analysis
AGE	Aerospace Ground Equipment
CCT	Clean Cam Technologies
CDRL	Contract Data Requirements List
CEM	continuous emissions monitoring
CFM	cubic feet per minute
CO	Carbon Monoxide
CO_2	Carbon Dioxide
DOT	Department of Transportation
DSCFM	dry standard cubic feet per minute
EQ	Environmental Quality Management, Inc.
FID	flame ionization detector
HAP	Hazardous Air Pollutant
IATA	International Aviation Transportation Association
ICAO	International Civil Aviation Organization
IXRF	Iridium X-ray Fluorescence
MCE	carbon mass rate – exhaust
MCF	carbon mass rate – fuel
MCI	carbon mass rate – inlet air
NIOSH	National Institute of Occupational Safety and Health
NO_X	Nitrogen Oxides
NMHC	Non Methane Hydrocarbons
PAH	Polynuclear Aromatic Hydrocarbons
PIC	product of incomplete combustion
PM	Particulate Matter
PPM	part per million
PPMVD	part per million by volume dry
RSEQ	Risk Analysis Environmental Quality
SAP	Sampling and Analysis Plan
SEM	scanning electron microscopy
SPO	System Program Office
THC	total hydrocarbon
TO	Technical Orders
TPM	Technical Program Manager
VOC	volatile organic compound

TEST METHOD REFERENCES

Air Force Institute for Environment, Safety and Occupational Risk Analysis (AFIERA), *Air Emissions Inventory Guidance Document for Mobile Sources at Air Force Installations*, January 2002.

American Society of Testing Materials (ASTM), http://www.astm.org/cgi-bin/SoftCart.exe/STORE/standardsearch.shtml?E+mystore

NIOSH Manual of Analytical Methods (NMAM), http://www.cdc.gov/niosh/nmam/nmammenu.html

United States Environmental Protection Agency (USEPA), Title 40, Code of Federal Regulations, Part 60, Appendix A http://www.epa.gov/ttn/emc/tmethods.html

USEPA SW846 http://www.epa.gov/epaoswer/hazwaste/test/methdev.htm

EXECUTIVE SUMMARY

An Emission Summary Scientific and Technical Report (Report) was previously prepared by Environmental Quality Management, Inc. (EQ) under Delivery Order Number T0702BG0204 of the General Services Administration (GSA) Federal Technology Service, IT Solutions, Greater Southeast Region (Contract Number GS-10F-0293K), Task FA5710043T6, and submitted May 2003. The report summarizes emissions from four AGE that underwent modification by Clean Cam Technologies.

The current contract and work order continues the scope of work previously completed. As part of this effort, this Addendum to that Report has been prepared by EQ under Delivery Order Number T0702BG1605 of the General Services Administration (GSA) Federal Technology Service, IT Solutions, Greater Southeast Region (Contract Number GS-10F-0293K), ACT A19556820. This addendum summarizes emissions from two diesel-powered AGE while burning bio diesel fuel.

Program Objectives

The purpose of this effort was to continue the scope of work previously completed and continue emissions testing of various AGE. As such, an –86 generator and Kubota NF2 light unit were tested at Scott AFB while operating on biodiesel fuel.

Biodiesel is an alternative fuel consisting of a mixture of diesel fuel and soybean oil. Biodiesel can be used in all diesel engines with little or no modification.

AGE Description

The –86 generator, rated at 148 brake horsepower (at 2000 RPM), is powered by the 4L-71N internal-combustion engine manufactured by Detroit Diesel Corporation. The Model A/M32A-86 is a naturally aspirated, two-stroke cycle, four-cylinder engine that utilizes a muffler and a 3-inch circular exhaust pipe exiting the bottom of the unit in a horizontal direction. The generator can be fueled on diesel, JP-8, or biodiesel fuel. The NF2 light unit operates a portable lighting system. The exhaust from the NF2 light unit travels through a muffler and a 2-inch round exhaust that exits at the bottom of the unit. Both AGE were fueled on biodiesel during the

program. The Kubota engine timing was set at 16.5 to 18.5 degrees before top dead center during testing.

Sampling Scenario

EQ traveled to Scott AFB to perform emission testing on several pieces of AGE. During the emissions test program, AF personnel operated the –86 generator and load bank to create specified loads. The –86 AGE was operated at 10%, 25%, 50%, 75% and 100% loads. The NF2 lighting unit was operated at one load, its maximum continuous sustainable while operating the lights. The average -86 load was recorded at 15-minute intervals during each test run.

The generator exhausts were measured for PM, including particle size distribution, nitrogen oxides (NO_x), carbon monoxide (CO), total non-methane hydrocarbons (TNMHC) and select hazardous air pollutants (HAPs). In conjunction with these tests, the exhaust flow rate, temperature, gas composition [carbon dioxide (CO_2) and oxygen (O_2)], and moisture were measured. Three one-hour tests for these parameters were completed at each of the specified loads, with the exception of HAPs. One composite test, consisting of 10-minute tests at each setting (50 minutes total duration), was completed for HAP analysis for the –86 unit; one composite test of one-hour was completed for the NF2 lighting unit. Sampling for HAPs consisted of sampling for volatile organic compounds (VOCs), aldehydes/ketones, and polynuclear aromatic hydrocarbons (PAH).

Emission Results

A summary of the criteria pollutant weighted-emissions are provided in Table ES-1. The –86 AGE did not meet the EPA Tier 1 standard for NO_x or the Tier 2 standard for NO_x plus NMHC. Neither generator met the EPA Tier 2 standard for PM. The pollutant weighting criteria are summarized in Table ES-2.

The weighted hazardous air pollutant emission indexes are summarized in Table ES-3.

TABLE ES-1. EMISSION SUMMARY
WEIGHTED RESULTS
SCOTT AFB

Unit No.	NO_X		CO		NMHC		PM		NO_X + NMHC
	lbs/gal	g/hp-hr	lbs/gal	g/hp-hr	lbs/gal	g/hp-hr	lbs/gal	g/hp-hr	g/hp-hr[a]
-86 (DG09)[b]	0.87	44.99	0.02	0.85	0.01	0.49	0.02	0.85	45.48
NF2 (FL08)[c]	0.20	2.92	0.09	1.23	0.01	0.14	0.02	0.27	3.06
EPA Tier 1		6.9							
EPA Tier 2				3.7				0.22	4.9

[a]EPA will use an NMHC +NOx standard of 4.9 g/hp-hr for Tier 2 nonroad diesel engines.
[b]The –86 utilizes a Detroit diesel engine.
[c]The NF2 light unit utilizes a Kubota diesel engine. Results shown for FL08 are not weighted, but are as emitted during a single continuous maximum load while operating the lights.

TABLE ES-2. WEIGHTING CRITERIA

Percent Load	Weighting Factor
100	0.05
75	0.25
50	0.30
25	0.30
10	0.10

Note: Weighting criteria specified in ISO 8178-4 "D2."

TABLE ES-3. AGE TESTING
SCOTT AFB
HAZARDOUS AIR POLLUTANTS (HAPs)
EMISSION FACTOR SUMMARY
lbs/1000 lbs fuel

	-86 (DG09)	NF2 (FL08)
Exhaust Flow, dscfm	344	30
Average Fuel Flow, lbs/hr	5.04	2.00
Pollutant		
Formaldehyde	2.06E-02	2.59E-02
Acetaldehyde	1.93E-02	8.18E-02
Acrolein	**ND**	3.82E-02
Isobutraldehyde, 2-Butanone (MEK)	4.83E-03	2.95E-02
Benzene	3.87E-02	2.18E-01
Bromomethane	3.30E-03	7.04E-04
Toluene	1.88E-02	8.96E-02
Ethylbenzene	1.12E-02	3.33E-02
Methylene chloride	1.03E-02	3.52E-02
m,p-Xylene	2.13E-02	7.68E-02
o-Xylene	8.90E-03	3.65E-02
Propanal	**ND**	1.64E-02
Total HAPs	**0.16**	**0.68**

ND = Not Detected

SECTION 1

INTRODUCTION

An Emission Summary Scientific and Technical Report (Report) was previously prepared by Environmental Quality Management, Inc. (EQ) under Delivery Order Number T0702BG0204 of the General Services Administration (GSA) Federal Technology Service, IT Solutions, Greater Southeast Region (Contract Number GS-10F-0293K), Task FA5710043T6, and submitted May 2003.

The current contract and work order continues the scope of work previously completed. As part of this effort, this Addendum to that Report has been prepared by EQ under Delivery Order Number T0702BG1605 of the General Services Administration (GSA) Federal Technology Service, IT Solutions, Greater Southeast Region (Contract Number GS-10F-0293K), ACT A19556820.

The project requirements were described in the contract and its attached Statement of Work.

The project included:

- Preparation of a SAP (Electronically submitted August 2003)
- Preparation of monthly progress, status, and management reports
- Preparation of conference agenda and minutes
- Preparation of a summary Scientific and Technical Report (this document).

A description of the project background and objectives is provided in this section.

1.1 Background

The A/M32A–86D (-86) generator is one of the most widely used pieces of aerospace ground support equipment (AGE) in the U.S. Air Force (AF). In June 1998, one -86 generator was retrofitted with the Clean Cam Technology (CCT) and tested at Southwest Research Institute in San Antonio, Texas. Emission test results showed that the CCT reduced nitrogen oxide (NO_x) emissions by 76%, carbon monoxide (CO) and total hydrocarbon (THC) emissions each by 43%, and particulate matter (PM) emissions by 32% compared to non-retrofitted –86

AGE. The emissions from the CCT unit met the Environmental Protection Agency (EPA) Non-Road Engine Emission Standards.

EQ completed an effort in 2002 to determine the long-term performance of the CCT retrofitted -86 generator. Prior to approving the CCT modification for general AF use, the AF needed to demonstrate that retrofitting did not negatively affect the operational performance of the unit, and that the CCT reduced emissions to an acceptable level.

In order to complete these objectives, four –86 generator engines (Detroit Diesel 4L-71N) were obtained through Warner Robins AFB in Georgia and retrofitted with the CCT at the Clean Cam Technology Systems facility in Bakersfield, CA. Two of the retrofitted engines were then installed in two –86 AGE at Elmendorf AFB, and two of the retrofitted engines were installed in two –86 AGE at Travis AFB, California. Emissions were measured during summer visits to each facility. The operational performance was evaluated by AGE Personnel at each location on four retrofitted units and compared to four non-retrofitted units.

Specifically, the testing program assessed emissions of PM, including particulate sizing, NO_x, CO, total non-methane hydrocarbons (TNMHC) and hazardous air pollutants (HAPs) through volatile organic compounds (VOC) and Aldehyde and Ketone sampling. In conjunction with these tests, stack gas flow rate, temperature, composition [carbon dioxide (CO_2) and oxygen (O_2)], and moisture were measured.

These parameters were measured at five specified loads: 10%, 25%, 50%, 75%, and 100%. A load bank (an artificial load comprised of heating coils) provided the resistance necessary for AGE operation at the specified loads.

The AGE were operated on diesel and JP-8 fuel. Fuels used during the testing were sampled and analyzed for: percent sulfur, carbon, nitrogen, hydrogen, ash, aromatics, paraffins, olefins, naphthenes, and Btu per pound.

Details of this sampling effort and results are included in the Clean Cam Technology –86 Demonstration Scientific and Technical Emission Summary Test Report submitted 5 May 2003. At the conclusion of the Clean CAM Technology program, it was determined to measure emissions from one AGE and one light unit while burning bio diesel fuel.

1.2 Objective

The purpose of this effort was to continue the scope of work previously completed and continue emissions testing of various AGE. As such, an –86 generator and Kubota NF2 light unit were tested at Scott AFB while operating on biodiesel fuel.

Biodiesel is an alternative fuel consisting of a mixture of diesel fuel and soybean oil. Biodiesel can be used in all diesel engines with little or no modification.

The testing effort assessed emissions of PM, including particulate sizing, NO_x, CO, total non-methane hydrocarbons (TNMHC) and hazardous air pollutants (HAPs) through volatile organic compounds (VOC), PAH and Aldehyde and Ketone sampling while the AGE operated on biodiesel. In conjunction with these tests, the exhaust flow rate, temperature, composition [carbon dioxide (CO_2) and oxygen (O_2)], and moisture were measured.

These parameters were measured at five specified loads: 10%, 25%, 50%, 75%, and 100%. A load bank (an artificial load comprised of heating coils) provided the resistance necessary for AGE operation at the specified loads. The NF2 light unit was operated at a single load, the maximum continuous load for this unit.

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SECTION 2

AGE DESCRIPTION AND EMISSIONS SAMPLING LOCATIONS

2.1 AGE Description

The –86 generator, rated at 148 brake horsepower (at 2000 RPM), is powered by the 4L-71N internal-combustion engine manufactured by Detroit Diesel Corporation. The Model A/M32A-86 is a naturally aspirated, two-stroke cycle, four-cylinder engine that utilizes a muffler and a 3-inch circular exhaust pipe exiting the bottom of the unit in a horizontal direction. The generator can be fueled on diesel, JP-8, or biodiesel fuel. The –86 diesel engine timing was set by the specifications noted in the technical order. The NF2 light unit operates a portable lighting system powered by a Kubota engine. The exhaust from the NF2 light unit travels through a muffler and a 2-inch round exhaust that exits at the bottom of the unit. Both units were fueled on biodiesel during the program. The Kubota engine timing was set at 16.5 to 18.5 degrees before top dead center during testing.

2.2 Sampling Locations

The –86 generator has an exhaust system that consists of a muffler and a 3-inch circular exhaust pipe that exits horizontally at the bottom of the unit; the NF2 light unit exhaust travels through a muffler and a 2-inch round exhaust. A temporary exhaust duct was connected to each exhaust to facilitate emission measurement. The extension consisted of a 90-degree elbow from the exhaust into a vertical straight run, directing the flow from a horizontal direction to a vertical. The vertical extension provided one sampling location that was for isokinetic sampling. This location was located at least 8 duct diameters (dd) downstream of the elbow. A second port was added to the vertical extension at a location at least one foot above the isokinetic port to provide access for a single-point sampling probe.

Due to the need for additional sampling parameters, a second straight run was added to the existing extension that ran horizontally from the -86 exhaust to the elbow. The horizontal insulated run consisted of an oval to circular transition and was of sufficient length to meet EPA Method 1A guidelines (at least 108" for sampling port locations in ducts less than 12 inches in

diameter) so that additional sampling ports could be added. A second location for isokinetic sampling was added within the horizontal straight run, at least two dd upstream of the elbow, and at least eight dd downstream of the exhaust. The addition of the second isokinetic sampling location allowed simultaneous testing for PM and HAPs, thereby reducing field time.

Finally, EPA Method 1A was used to locate the velocity measurement points in the exhaust stack. Specifically, eight points, four on each of two perpendicular diameters, were used for velocity measurements. The velocity ports were ½" i.d. ports located a minimum of 2 dd upstream of the extension's terminus, and 8 dd downstream of the single-point and isokinetic sampling ports.

See Figures 2-1 and 2-2 for sample point schematics.

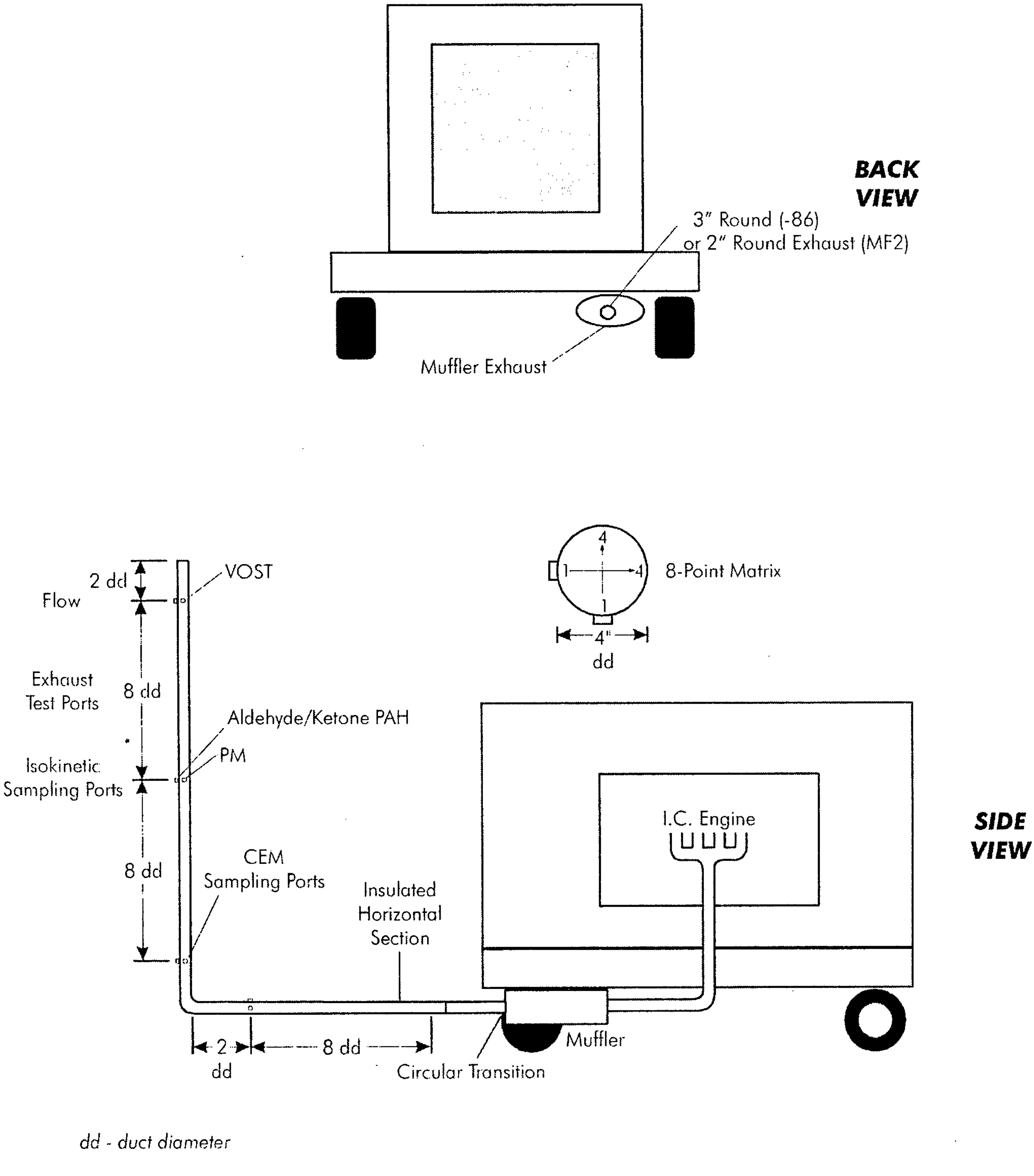

Figure 2-1. Schematic of -86 and NF2 Light Unit Stack Extension Modification

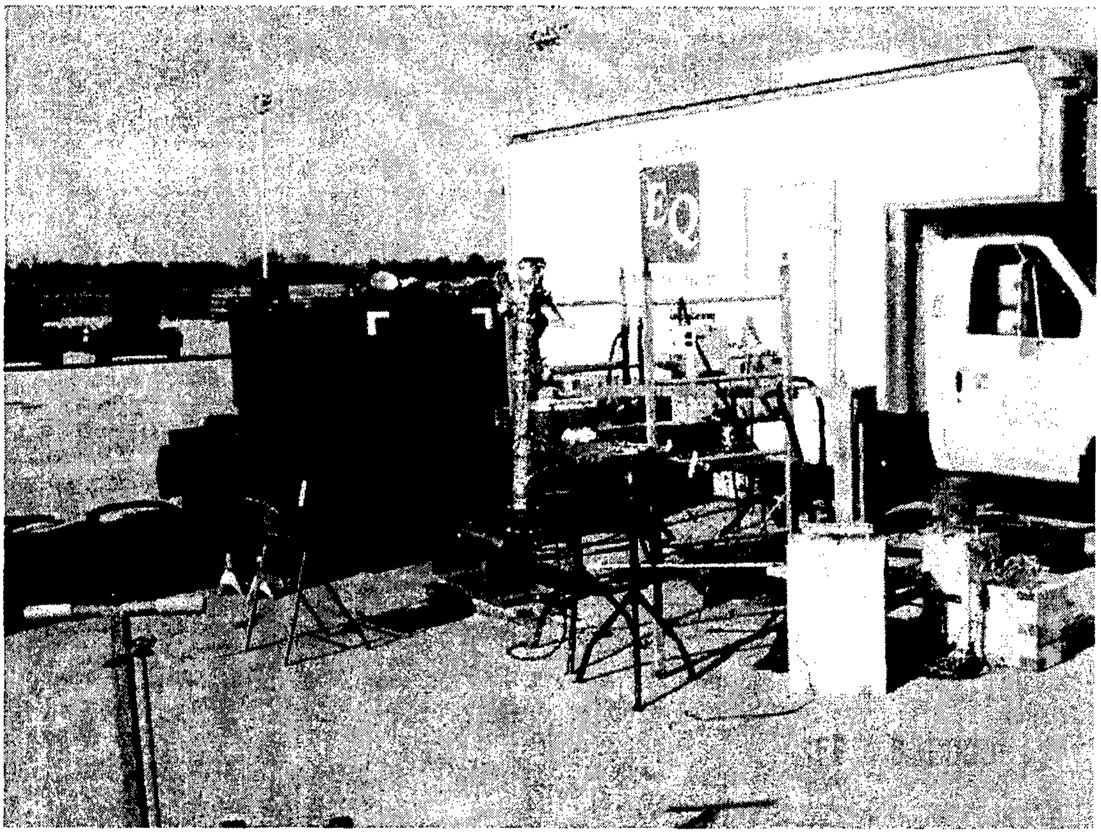

Figure 2-2. Photograph of Test Configuration at Scott AFB

SECTION 3

SAMPLING APPROACH

3.1 Engine Logistics

Scott AFB personnel identified one –86 AGE and one NF2 light unit for use in this program. Table 3-1 outlines the sampling program and responsibilities.

3.2 Sampling Scenario

EQ traveled to Scott AFB to perform emission testing on the two AGE. During the emission test program, AF personnel operated the –86 generator and load bank to create specified loads. The –86 AGE was operated at 10%, 25%, 50%, 75% and 100% loading. The NF2 light unit was operated at one load, the maximum continuous sustainable for this unit. The average load was recorded at 15-minute intervals during each test run.

The AGE were measured for PM including particle size distribution, NO_x, CO, TNMHC, O_2, CO_2 and HAPs (VOC, aldehydes and ketones, and PAH). Three one-hour tests for these parameters were completed at each of the specified loads, with the exception of HAPs. One composite test, consisting of 10-minute tests at each setting (50 minutes total duration), was completed for HAPs analysis for the –86 unit; one composite test of one-hour was completed for the NF2 lighting unit. Sampling for HAPs consisted of VOCs, aldehydes/ketones, and polynuclear aromatic hydrocarbons (PAH).

See Table 3-2 for Sampling Outline.

3.3 Sampling Schedule

Sampling was completed, as follows:

- Day one, September 8, 2003: Travel, Equipment Set-up; First AGE tested at 10%;
- Day two, September 9, 2003: First AGE tested at 25%, 50% and 75% load settings,

TABLE 3-1. SAMPLING PROGRAM BREAKDOWN OF RESPONSIBILITIES

Phase	Responsibility	
	EQ	**Air Force Personnel**
Engine Logistics	• EQ to contact Scott AFB • EQ to travel to Scott AFB for site survey and kick-off meeting	• Provide –86 and Kubota NF2 light unit for testing. • Participate in site survey and kick-off meeting
Emissions Testing	• Sampling equipment calibration and operation (includes manual methods and CEM methods) prior to and during testing • Sample shipment and analysis of exhaust and fuel samples • Supply external fuel tank • Maintain Quality Assurance/Quality Control procedures	• AGE operation prior to and during testing • Fueling of AGE prior to and during testing • Provide Bio-diesel fuel to operate AGE during emissions testing • Operation of generator load bank to create and maintain 10%, 25%, 50%, 75% and 100% loads during testing • Record data on AGE operation during emissions testing • Provide assistance with fittings and means of connecting fuel tank to AGE.
Schedule	• Schedule testing	• Approve schedule
Reporting	• Participate in kick-off meeting • Complete monthly progress reports • Participate in quarterly conference calls, as required • Provide meeting minutes • Collect, assemble, and analyze data and prepare final test results in electronic PDF format	• Participate in kick-off meeting • Participate in quarterly conference calls, as required

TABLE 3-2. TARGET EXHAUST POLLUTANTS FOR EACH ENGINE SETTING

Load Setting	Sampling Duration	Particulate Matter	HAPs[a] (VOC, ALD/KEY, PAH)	NO_x	TNMHC	CO	CO_2	O_2
-86 AGE								
10%	3 hours (Three 1-hour test runs)	X	X	X	X	X	X	X
25%	3 hours (Three 1-hour test runs)	X	X	X	X	X	X	X
50%	3 hours (Three 1-hour test runs)	X	X	X	X	X	X	X
75%	3 hours (Three 1-hour test runs)	X	X	X	X	X	X	X
100%	3 hours (Three 1-hour test runs)	X	X	X	X	X	X	X
Light Unit NF2								
Constant Maximum Load	3 hours (Three 1-hour test runs)	X	X	X	X	X	X	X

[a]The HAP samples were composite samples collected over each setting. Approximately one hour of sample was collected for each AGE.

- Day three, September 10, 2003: First AGE tested at 100% load setting; Second unit tested at maximum continuous load setting

- Day four, September 11, 2003: Tear down and depart site

Testing personnel arrived onsite at least one hour prior to emissions test start-up time. Continuous emissions monitors (CEMs) were calibrated, and manual testing equipment was field checked. The AGE was fueled and started by AF personnel one-half hour before testing commenced. Following the final emissions test each day, EQ personnel recovered the samples, calibrated CEMs, and prepared for the following day's testing.

3.4 Fuel Consumption

Accurate measurement of fuel use was imperative so that emission rates could be correlated with fuel consumption rates. Emission rates could then be expressed in pounds of pollutant per thousand gallons of fuel consumed. Access to the fuel tank was difficult for the –86 generator and NF2 light unit. Therefore, an auxiliary fuel tank was connected directly to the test unit's primary fuel filter (see Figure 3-1). A tee fitting (or equivalent) was installed at the input side of the filter. This placement facilitated use of the fuel shut-off valve to isolate the test unit tank. The fuel line was then attached directly into the auxiliary fuel tank. The fuel tank was placed on top of a platform balance with a sensitivity of 0.1 lb; weights were recorded at the beginning and end of each test run. When the fuel was added during the test, it was supplied from pre-weighed jerry cans, with the weight of the can being recorded after the addition. In this way, the overall fuel consumption could be accurately calculated. The temperature of the fuel was monitored during testing.

In order to minimize fuel measurement errors, the fuel feed and return lines were suspended above the external tank. This eliminated errors in weight measurement caused by the fuel line mass.

Figure 3-2 presents a photograph of an external fuel task. Figure 3-3 presents a fuel supply photograph.

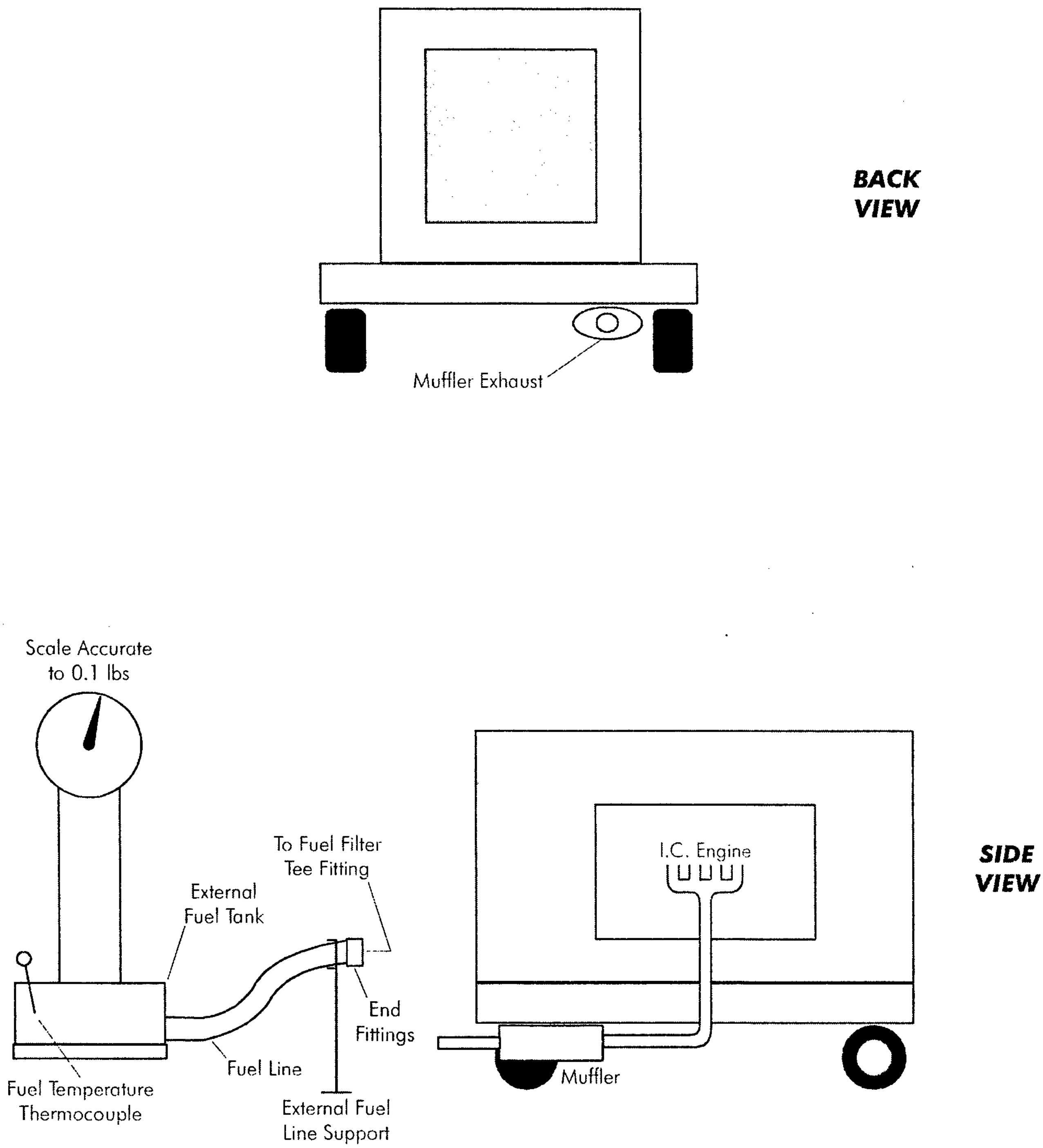

Figure 3-1. Schematic of External Fuel Tank

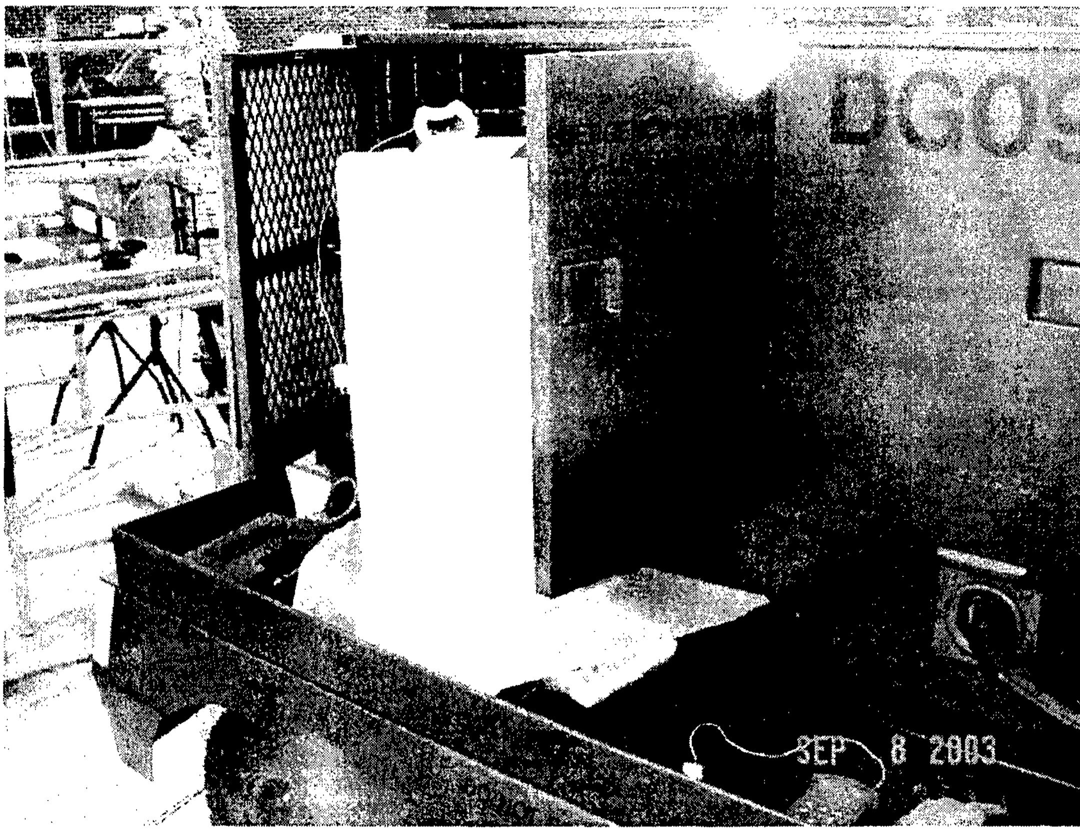

Figure 3-2. External Fuel Tank Photograph (Scott AFB)

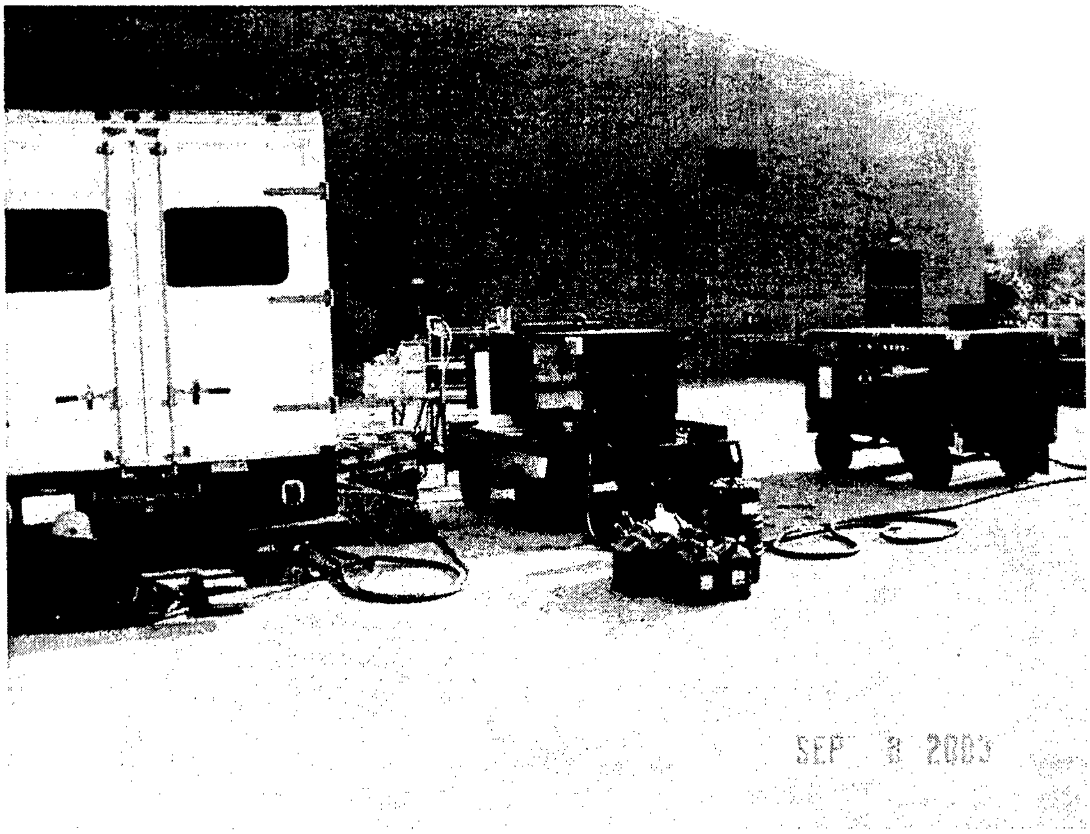

Figure 3-3. Fuel Supply Photograph (Scott AFB)

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SECTION 4

TEST METHODOLOGY

This sample program involved sample collection from the exhausts of two units, a –86 generator and an NF2 light unit. The focus of the program was quantify engine emissions. Emission sampling was completed at five load settings, for the –86 generator; sampling was completed at one load only for the light unit.

Sampling was completed for the following compounds at the exhausts:

- Oxygen and Carbon Monoxide (EPA Method 3A)
- Flow Rate and Moisture (EPA Methods 1-4)
- Filterable and Condensible Particulate (EPA Methods 5 and 202)
- Nitrogen Oxides (EPA Method 7E)
- Carbon Monoxide (EPA Method 10)
- HAPs: Characterized through VOCs (EPA Method 0030), Aldehydes and Ketones (EPA Method 0011), and polynuclear aromatic hydrocarbons (NIOSH Method 5506)
- Total Non-Methane Hydrocarbons (TNMHC) as Total Hydrocarbons (THC) and Methane (EPA Method 25A)

The AGE exhausts were not sampled for sulfur dioxide, metals, or semi-volatiles.

4.1 Exhaust Emission Test Methods

4.1.1 Stack Gas Volumetric Flow Rate

EPA Method 2A, "Determination of Stack Gas Velocity and Volumetric Flow Rates," was used to determine stack gas volumetric flow rates. Standard pitot tubes meeting the EPA specifications and an inclined manometer were used to measure velocity pressures. A calibrated Type "K" thermocouple was used to measure stack gas temperature. The stack gas velocity was calculated from the average square root of the stack gas velocity pressure, average stack gas temperature, stack gas molecular weight, and absolute static pressure. The volumetric flow rate

was the product of velocity and stack cross-sectional area. The velocity measurements were made in the horizontal exhaust extension upstream of the sampling trains to avoid any flow disturbances.

4.1.2 Carbon Dioxide and Oxygen

EPA Method 3A was used to measure the concentration of CO_2 and O_2 in the stack gas. A zirconium oxide-based analyzer was calibrated with zero and three calibration gases before each test day. The calibration gases had concentrations of approximately 40% and 80% of the full-scale response of the analyzer. At the end of each sampling period, the analyzer was challenged with a zero and an upscale calibration gas. The calibration gasses were EPA Protocol ($\pm$2%) gases. The analyzer operated continuously through each of the test runs.

4.1.3 Stack Gas Moisture Content

EPA Reference Method 4, "Determination of Moisture Content in Stack Gases," was used to determine the moisture content of the exhaust. This method was conducted as part of each particulate measurement run. The initial and final contents of all impingers was determined gravimetrically.

4.1.4 Particulate Sampling

EPA Method 5, "Determination of Particulate Emissions from Stationary Sources," was used to determine filterable particulate matter, and EPA Method 202 was used to determine condensable (back-half), organic, and inorganic particulate matter. The sampling train consisted of a heated glass-lined probe, heated glass-fiber filter, and a series of impingers followed by a vacuum pump, dry gas meter, and calibrated orifice. The filter temperature was maintained between 223° and 273°F. Thermocouples were used to monitor temperatures of the stack gas, sample probe, filter, and impinger exit gas.

For each load setting, one particulate sample was analyzed by scanning electron microscopy (SEM) equipped with an iridium X-ray fluorescence (IXRF) digital image system to determine the particulate size distribution by count and the aerodynamic particle shape. The EPA Method 5 filter media was modified for SEM analysis. A polycarbonate filter media was used after discussion with the analytical laboratory. The filter media chosen was based on the intent of gaining the highest possible quantity of measurable particulate matter.

4.1.5 Nitrogen Oxides (NO_x)

EPA Reference Method 7E, "Determination of Nitrogen Oxide Emissions from Stationary Sources (Instrumental Analyzer Procedure)," was employed. EQ used a chemiluminescent NO_x analyzer, manufactured by Thermo Environmental Instruments, for nitrogen oxide emission monitoring. The NO_x analyzer was operated continuously during each sampling test run. A zero and three calibration gases for the NO_x analyzer were used prior to the initial test run and at the end of each one-hour sampling period. The calibration gases were EPA Protocol calibration gases.

A stainless steel probe with a three-way valve on the exit end was inserted directly into the stack with a heated Teflon sample line attached to one side of the valve, and the calibration gas line attached to the other side. A conditioning system was attached to the exit end of the heated line for moisture removal. An unheated Teflon line connected the conditioning system and the analyzer. The same heated system was used to manifold stack and calibration gas to the NO_x and CO analyzers.

4.1.6 Carbon Monoxide (CO)

The CO concentration was measured by EPA Method 10. The CO sampling system used the same sampling system as described for the NO_x sampling system, plus a sample pump and a TECO Model 48 CO analyzer. The analyzer was calibrated with EPA Protocol calibration standards, and results were charted on a strip chart recorder.

4.1.7 Aldehydes and Ketones

The sampling train utilized to perform aldehyde and ketone sampling conformed to EPA Method 0011. A single composite sample run was collected over multiple engine loads.

4.1.8 Volatile Organic Compounds (VOCs)

EPA Method 0030, "Determination of Volatile Principal Organic Hazardous Constituents," was used to measure volatiles from the AGE exhaust. A 20-liter exhaust gas sample was collected at a constant rate of 0.25 liter per minute. A volatile organic sampling train (VOST) was used consisting of a glass-lined probe, a series of resin traps, and a condensate container. A single sample was collected over multiple engine load settings. Table 4-1 notes the target compounds.

TABLE 4-1. SUMMARY OF SOURCE TARGET COMPOUNDS FOR VOLATILE ORGANIC COMPOUNDS (EPA Method 0030)

VOST Compounds	
Acetone	1,2-Dichloropropane
Benzene	1,3-Dichloropropane
Bromobenzene	2,2-Dichloropropane
Bromochloromethane	Cis-1,3-Dichloropropene
Bromodichloromethane	Trans-1,3-Dichloropropene
Bromoform	1,2-Dichloropropene
Bromomethane	Ethylbenzene
1,3-Butadiene	Hexachlorobutadiene
2-Butanone	2-Hexanone
n-Butylbenzene	Isopropylbenzene
Sec-Butylbenzene	p-Isopropyltoluene
Tert-butylbenzene	Methylene chloride
Carbon disulfide	4-Methyl-2-pentanone
Carbon tetrachloride	Naphthalene
Chlorobenzene	n-Propylbenzene
Chlorodibromomethane	Styrene
Chloroethane	1,1,1,2-Tetrachloroethane
Chloroform	1,1,2,2-Tetrachloroethane
Chloromethane	Tetrachloroethene
2-Chlorotoluene	Toluene
4-Chlorotoluene	1,2,3-Trichlorobenzene
1,2-Dibromo-3-chloro-propane	1,2,4-Trichlorobenzene
1,2-Dibromoethane	1,1,1-Trichloroethane
Dibromoethane	1,1,2-Trichloroethane
1,2-Dichlorobenzene	Trichloroethene
1,3-Dichlorobenzene	Trichlorofluoromethane
1,4-Dichlorobenzene	1,2,3-Trichloropropane
Dichlorodifluoromethane	1,2,4-Trimethylbenzene
1,1-Dichloroethane	1,3,5-Trimethylbenzene
1,2-Dichloroethane	Vinyl chloride
Cis-1,2-Dichloroethane	m-Xylene & p-Xylene
Trans-1,2-Dichloroethane	o-Xylene
1,1-Dichloroethane	

4.1.9 Polynuclear Aromatic Hydrocarbons (PAH)

National Institute of Occupational Safety and Health (NIOSH) Method 5506 was used to collect a sample for the target pollutants shown in Table 4-2. A sample was drawn through an in-stack filter across an XAD-2 resin trap at approximately 0.25 liter per minute. A single sample was collected over multiple engine load settings.

4.1.10 Total Non-Methane Hydrocarbons (TNMHC)

EPA Method 25A, "Determination of Total Hydrocarbons using a Flame Ionization Analyzer," was used to measure the TNMHC emissions. Stack gases were withdrawn via a stainless steel in-stack probe and heated (250°F) Teflon sample line, and delivered to the flame ionization detector (FID) with a heated sample pump. The analyzer, via an internal pumping system, withdrew the gas from the stack. Once inside the analyzer, the gas stream was split; a portion of the system was directed to an FID identical to the inlet, and a portion was directed to a proprietary-design non-methane hydrocarbon cutter. The cutter oxidized all hydrocarbons except methane. The methane-containing gas stream was then sent to an FID that determined the methane concentration. The response from each detector was converted to an analog signal (voltage) and recorded using a data acquisition system.

The analyzer was calibrated prior to, and at the conclusion of, each test run by using EPA Protocol 1 Calibration Gases.

A methane response factor for the analyzer was obtained by introducing a methane calibration gas to the calibrated J.U.M. 109A analyzer. The calibration gas value for methane and its relationship to the response of the THC analyzer yields the methane response factor. The response factor was divided into the average methane concentration determined during sampling on the analyzer to allow the methane results to be calculated as methane. The methane content, as methane, was then subtracted from the THC measured to determine the total non-methane THC, as methane.

4.2 Fuel Analysis

One composite fuel sample was taken during emission testing. Fuel samples were collected from the fuel supply line and analyzed for the parameters listed in Table 4-3.

TABLE 4-2. TARGET POLYNUCLEAR AROMATIC HYDROCARBONS (PAH) (NIOSH METHOD 5506)

Polynuclear Aromatic Hydrocarbons	
Naphthalene	Chrysene
Acenaphthylene	Benzo[b]fluoranthene
Acenaphthene	Benzo[k]fluoranthene
Fluorene	Benzo[a]pyrene
Anthacene	Benzo[e]pyrene
Phenanthrene	Benzo[ghi]perylene
Fluoroanthene	Indeno[1,2,3-cd]pyrene
Pyrene	Dibenz[a,h]anthracene
Benz[a]anthracene	

TABLE 4-3. FUEL ANALYSIS

Analyte	Analytical Method
Sulfur (%)	ASTM D 5453
Carbon (%)	ASTM D 5291
Nitrogen (%)	ASTM D 4629
Hydrogen (%)	ASTM 5291
Ash (%)	ASTM D 482
Aromatics	PONA Analysis
Paraffins	PONA Analysis
Olefins	PONA Analysis
Naphthenes	PONA Analysis
Btu/lb	ASTM D 240

SECTION 5

RESULTS

The purpose of this effort was to continue the scope of work previously completed (i.e. continue emissions testing of various AGE). As such, an –86 generator and NF2 light unit were tested at Scott AFB while operating on biodiesel fuel.

Biodiesel is a non-toxic and biodegradable alternative fuel and diesel additive made from vegetable oil. Biodiesel contains no petroleum, but can be blended with petroleum diesel to create a biodiesel blend. Biodiesel can be used in all diesel engines with little or no modification. Biodiesel burns cleaner than petroleum diesel and releases less CO_2 and PAH.

The testing effort assessed emissions of PM10, including particulate sizing, NO_x, CO, TNMHC and HAPs, consisting of VOC, PAH and aldehyde/ketones while the AGE operated on biodiesel. In conjunction with these tests, stack gas flow rate, temperature, composition (CO_2 and O_2), and moisture were measured.

These parameters were measured at five specified loads: 10%, 25%, 50%, 75%, and 100%. A load bank (an artificial load comprised of heating coils) provided the resistance necessary for AGE operation at the specified loads. The NF2 light unit was operated at a single load, the maximum continuous load.

5.1 EPA Tier 2 Pollutants

Emissions were collected directly from the engine's tailpipe through an exhaust stack. The results of the sampling are provided in the following sections. Table 5-1 illustrates a summary of trends of average emission factors for each pollutant at each load setting, for both units while operating on biodiesel fuel. Additional detail including emission results from individual runs, horsepower, and fuel usage is provided for each load setting in Tables 5-2 through 5-4.

5.1.1 Horsepower Calculations

During the emission test program, specific engine parameters were monitored to note engine performance. Facility personnel were responsible for collecting and maintaining the operating

TABLE 5-1. AGE EMISSION FACTOR SUMMARY

Pollutant	Load Setting									
	10%		25%		50%		75%		100%	
	lbs/gal	g/hp-hr	lbs/gal	g/hp-hr	lbs/gal	g/hp-hr	lbs/gal	g/hp-hr	lbs/gal	g/hp-hr
NO_X										
DG09	0.92	139.82	0.84	38.19	0.87	35.30	0.88	30.92	0.86	24.51
FL08	NA	NA	NA	NA	NA	NA	NA	NA	0.20	2.92
CO										
DG09	0.016	2.35	0.021	0.94	0.013	0.53	0.018	0.63	0.012	0.33
FL08	NA	NA	NA	NA	NA	NA	NA	NA	0.086	1.23
NMHC										
DG09	0.012	1.75	0.011	0.51	0.008	0.34	0.006	0.21	0.006	0.18
FL08	NA	NA	NA	NA	NA	NA	NA	NA	0.010	0.14
PM										
DG09	0.014	2.13	0.014	0.65	0.022	0.89	0.018	0.65	0.011	0.31
FL08	NA	NA	NA	NA	NA	NA	NA	NA	0.019	0.27
CO_2	%		%		%		%		%	
DG09	4.17		4.27		4.87		6.15		5.53	
FL08	NA		NA		NA		NA		4.17	
O_2	%		%		%		%		%	
DG09	16.13		15.57		14.67		12.83		13.53	
FL08	NA		NA		NA		NA		15.10	

Notes:

- DG09 is an A/M32-86 Generator; FL08 is an NF2 Light Unit.
- Units were operated with Biodiesel fuel during testing.
- Results presented are the average of three runs.
- FL08 was tested while operating at its constant maximum rate only.

TABLE 5-2. A/M32–86
EMISSION FACTOR SUMMARY

10% LOAD - SCOTT AFB

Run No.	Unit No.	Fuel usage, gal/hr	Calculated hp	NO_X		CO		NMHC		PM		CO_2	O_2
				lbs/gal	g/hp-hr	lbs/gal	g/hp-hr	lbs/gal	g/hp-hr	lbs/gal	g/hp-hr	%	%
1	DG09	3.51	10.87	0.98	143.63	0.02	2.41	0.02	2.20	0.02	2.21	4.20	16.20
2	DG09	3.62	10.87	0.92	138.91	0.02	2.34	0.01	1.55	0.01	1.77	4.20	16.10
3	DG09	3.82	10.87	0.86	136.93	0.01	2.31	0.01	1.49	0.02	2.41	4.10	16.10
Avg.	DG09	3.65	10.87	0.92	139.82	0.02	2.35	0.01	1.75	0.01	2.13	4.17	16.13

25% LOAD - SCOTT AFB

Unit No.	Fuel usage, gal/hr	Calculated hp	NO_X		CO		NMHC		PM		CO_2	O_2
			lbs/gal	g/hp-hr	lbs/gal	g/hp-hr	lbs/gal	g/hp-hr	lbs/gal	g/hp-hr	%	%
DG09	4.32	43.48	0.82	37.16	0.01	0.60	0.01	0.42	0.01	0.66	4.30	15.90
DG09	4.37	43.48	0.87	39.57	0.01	0.63	0.01	0.39	0.01	0.59	4.40	15.60
DG09	4.39	43.48	0.11	37.86	0.03	1.58	0.02	0.71	0.02	0.69	4.10	15.20
DG09	4.36	43.48	0.60	38.19	0.02	0.94	0.01	0.51	0.01	0.65	4.27	15.57

TABLE 5-3. A/M32–86 EMISSION FACTOR SUMMARY

50% LOAD - SCOTT AFB

Unit No.	Fuel usage, gal/hr	Calculated hp	NO_X		CO		NMHC		PM		CO_2	O_2
			lbs/gal	g/hp-hr	lbs/gal	g/hp-hr	lbs/gal	g/hp-hr	lbs/gal	g/hp-hr	%	%
DG09	5.11	56.52	0.85	34.94	0.01	0.53	0.01	0.36	0.02	0.74	4.90	14.70
DG09	5.03	56.52	0.88	35.69	0.01	0.53	0.01	0.34	0.03	1.11	4.90	14.60
DG09	4.94	56.52	0.89	35.27	0.01	0.52	0.01	0.31	0.02	0.81	4.80	14.70
DG09	5.03	56.52	0.87	35.30	0.01	0.53	0.01	0.34	0.02	0.89	4.87	14.67

75% LOAD - SCOTT AFB

Run No.	Unit No.	Fuel usage, gal/hr	Calculated hp	NO_X		CO		NMHC		PM		CO_2	O_2
				lbs/gal	g/hp-hr	lbs/gal	g/hp-hr	lbs/gal	g/hp-hr	lbs/gal	g/hp-hr	%	%
1	DG09	6.34	82.61	0.91	31.56	0.02	0.67	0.01	0.26	0.02	0.69	6.20	12.80
2	DG09	6.43	82.61	0.88	31.17	0.02	0.63	0.01	0.19	0.02	0.78	6.20	12.80
3	DG09	6.37	82.61	0.86	30.04	0.02	0.60	0.01	0.19	0.01	0.47	6.05	12.90
Avg.	DG09	6.38	82.61	0.88	30.92	0.02	0.63	0.01	0.21	0.02	0.65	6.15	12.83

TABLE 5-4. A/M32–86
EMISSION FACTOR SUMMARY

100% LOAD - SCOTT AFB

Run No.	Unit No	Fuel usage, gal/hr	Calculated hp	NO_X		CO		NMHC		PM		CO_2	O_2
				lbs/gal	g/hp-hr	lbs/gal	g/hp-hr	lbs/gal	g/hp-hr	lbs/gal	g/hp-hr	%	%
1	DG09	5.94	91.31	0.86	25.38	0.01	0.32	5.62E-03	0.17	0.01	0.26	5.40	13.70
2	DG09	5.54	91.31	0.88	24.37	0.01	0.34	6.65E-03	0.18	0.01	0.36	5.60	13.30
3	DG09	5.81	91.31	0.82	23.77	0.01	0.33	6.38E-03	0.18	0.01	0.30	5.60	13.60
Avg.	DG09	5.77	91.31	0.86	24.51	0.01	0.33	6.21E-03	0.18	0.01	0.31	5.53	13.53

NF2 LIGHT UNIT EMISSION SUMMARY
100% LOAD - SCOTT AFB

Run No.	Unit No.	Fuel usage, gal/hr	Calculated hp	NO_X		CO		NMHC		PM		CO_2	O_2
				lbs/gal	g/hp-hr	lbs/gal	g/hp-hr	lbs/gal	g/hp-hr	lbs/gal	g/hp-hr	%	%
1	FL08	0.27	8.70	0.22	3.12	0.09	1.24	9.92E-03	0.14	0.02	0.28	4.10	14.90
2	FL08	0.27	8.70	0.19	2.73	0.09	1.24	1.03E-02	0.15	0.02	0.23	4.10	15.10
3	FL08	0.27	8.70	0.20	2.93	0.08	1.20	9.93E-03	0.14	0.02	0.29	4.30	15.30
Avg.	FL08	0.27	8.70	0.20	2.92	0.09	1.23	1.01E-02	0.14	0.02	0.27	4.17	15.10

data and for operating the engine in a safe manner. Select engine operation parameters (including load setting, horsepower, and fuel usage) are included in Tables 5-2 through 5-4.

Accurate measurement of fuel use was imperative so that emission rates could be correlated with fuel consumption rates, expressed in pounds of pollutant per thousand gallons of fuel consumed. In addition, horsepower could not be measured directly. Therefore, horsepower was calculated by multiplying the fuel usage an equation utilizing the AGE ampere and volts data converting to kilowatts and subsequently to horsepower. This calculation, provided by USAF personnel, allowed the emission rates to be correlated with horsepower, expressed as grams per horsepower hour (g/hp-hr). This data could then be compared directly with EPA's Tier 2 standards for non-road engines (as discussed in Section 5.1.5).

Calculated horsepower averaged 10.87 at 10%, 43.48 at 25%, 56.52 at 50%, 82.61 at 75%, and 91.31 at 100% load settings for the –86 generator; the NF2 light unit averaged 8.70 horsepower while operating at its maximum continuous load. Fuel usage averaged about 3.6 gal/hr, 4.3 gal/hr, 5.0 gal/hr, 6.4 gal /hr, and 5.8 gal/hr at 10%, 25%, 50%, 75%, and 100%, respectively for the –86 generator; the NF2 light unit fuel usage averaged 0.27 gal/hr.

5.1.2 Gaseous Emissions

Tables 5-1 through 5-4 present the gaseous emissions data collected at the five power settings (100%, 75%, 50%, 25%, and 10%) at which the –86 generator was operated during testing. In general, gaseous pollutant emission factors for NO_x, CO, and NMHC reported as lbs/gal remained consistent across the five power settings. However, NOx emission factors in g/hp-hr decreased by 80% when operation was reduced from 10% to 25%. Emission factors for CO and NMHC decreased one-half to one-third as operation was increased from a load settting of 10% to 25%, and decreased again by a similar factor from 25% to 50%. Emission factors for NO_x and CO then remained fairly consistent from the 50% to 100% load settings while NMHC continued to decrease significantly as power increased. Percent CO_2 increased and percent O_2 decreased as the load setting increased from 10% to 100%.

The NF2 light unit was operated at a continuous maximum load; therefore trends are not available for comparison at various loads. When compared with the –86 generator, however, the NF2 light unit CO emission factor was almost five times greater than that of the –86, and the NO_X emission factor was almost 90% less than the –86. Emission factors for NMHC were similar.

5.1.3 Particulate

Testing for particulate emissions was completed on both the –86 and NF2 light unit. Particulate emission factors in lbs/gal almost doubled from the 25% load setting to the 50% load setting, and then decreased at 75% and again at 100% for the –86 generator. Particulate emission factors expressed in g/hr-hr behaved similarly. The NF2 light unit PM emission factor was similar to the –86. Tables 5-1 through 5-4 provide detailed results.

During the second PM test run, the filter media consisted of a polycarbonate material to allow for improved particle characterization by scanning electron microscopy. Each test run that used this material gained approximately twice the particulate mass as the other test runs. A review of the data determined that the mass gained, but not the particle distribution, was compromised by the filter material. However, these runs were included in the PM average as the emission rates were comparable with the first and third runs.

5.1.4 Particulate Characterization

During one run at each setting, a particle sample was collected on a polycarbonate filter for analysis via scanning electron microscopy to count the particles in each size range. The results of the particle counts are provided in Table 5-5. The analysis determined that the majority of particulate matter (>99%) was below 10 microns in size, with >80% of the particles at a diameter below 2.5 microns.

The distribution of the particles by mass was consistent. As the load increased from 25% to 50% the mass of particles less than 2.5 microns decreased from about 10% to 3%; as load increased from 50% to 100%, the mass of particles less than 2.5 microns increased again to about 8%. The analysis of the NF2 light unit at its maximum was comparable with the –86 analysis at 100% load.

5.1.5 Comparison to EPA Tier 2 Non-road Standards

Results from the five load settings were weighted based on the quantity of time spent at each load setting (ISO 8178-4 "D2") and compared to EPA Tier 2 Non-Road standards (Table 5-6). Although emissions of NO_X operating on biodiesel were expected to be lower, testing did not support this finding. Testing illustrated non-compliance with Tier 2 for the combined NO_X+NMHC standard of 4.9 g/hp-hr for the –86 generator. Both units were well within the CO standard of 3.7 g/hp-hr. However, neither of the units were able to meet the PM standard of 0.22 g/hp-hr, although the NF2 light unit was much closer than the –86 generator.

TABLE 5-5. PERCENTAGES OF NON-CARBON PARTICLES IN VARIOUS DIAMETER RANGES BY NUMBER OF PARTICLES

Diameter Range Engine Load (μm)	10%	25%	50%	75%	100%	100% (Light Unit FL08)
.5-2.5	80.47	83.96	84.51	82.14	84.50	89.40
2.5-5.0	14.63	12.00	11.79	13.85	13.18	8.61
5.0-7.5	3.62	2.78	2.31	2.43	1.55	1.66
7.5-10	0.91	0.87	0.35	0.96	0.00	0.00
>10	0.38	0.38	1.04	0.62	0.78	0.33

PERCENTAGES OF NON-CARBON PARTICLES IN VARIOUS DIAMETER RANGES BY ESTIMBATED MASS OF PARTICLES

Diameter Range Engine Load (μm)	10%	25%	50%	75%	100%	100% (Light Unit FL08)
.5-2.5	9.74	8.27	3.24	7.75	7.54	8.96
2.5-5.0	23.99	18.92	5.33	18.08	17.78	17.26
5.0-7.5	24.39	21.55	5.39	14.15	10.18	10.27
7.5-10	14.26	18.58	2.36	13.66	0.00	0.00
>10	27.62	32.68	83.68	46.36	64.50	63.52

TABLE 5-6. EMISSION SUMMARY WEIGHTED RESULTS SCOTT AFB

Unit No.	NO_X		CO		NMHC		PM		NO_X + NMHC
	lbs/gal	g/hp-hr	lbs/gal	g/hp-hr	lbs/gal	g/hp-hr	lbs/gal	g/hp-hr	g/hp-hr[a]
-86 (DG09)[b]	0.87	44.99	0.02	0.85	0.01	0.49	0.02	0.85	45.48
NF2[c] (FL08)[d]	0.20	2.92	0.09	1.23	0.01	0.14	0.02	0.27	3.06
EPA Tier 1		6.9							
EPA Tier 2				3.7				0.22	4.9

[a]EPA will use an NMHC +NOx standard of 4.9 g/hp-hr for Tier 2 nonroad diesel engines.
[b]The –86 utilizes a Detroit diesel engine.
[c]The NF2 utilizes a Kubota diesel engine.
[d]Results shown for FL08 are not weighted, but are as emitted during a single continuous maximum load.

5.2 Hazardous Air Pollutants (HAPs)

Emissions of HAPs were quantified from the two AGE. This was accomplished by collecting a composite sample over five engine load settings (10% through 100%) for the –86 generator (DG09) and over the maximum load setting for the NF2 (FL08). The composite was collected for VOCs, PAHs, and aldehydes/ketones, those parameters that featured most prominently in past sampling episodes. An overall HAP emission factor was calculated for each AGE. The HAP emission factor from generator DG09 was almost one-third that of the emission factor from the NF2 light unit. See Table 5-7 for a detailed breakdown of detected HAPs.

5.2.1 Volatile Organic Compounds (VOC)

Speciation of VOC from a composite sample over the 10% load setting to the 100% load setting was performed for the –86 generator, and over one hour for the NF2 light unit. The detected compounds were similar to the speciated HAPs determined in historical test programs. These HAPs were naphthalene, benzene, toluene, ethylbenzene, xylene, styrene, bromomethane, and chloromethane, a number of which were detected in the exhaust stream. The portion of the HAP emission factor contributed by VOC was approximately 75%. A summary of the volatile emissions is provided in Table 5-8.

5.2.2 PAH

A PAH composite sample over engine load settings of 10% through 100% was collected for the –86 generator, and over one-hour for the NF2 light unit. All PAH compounds were non-detect above 2 • g. See Table 5-9 for more detailed information on PAH emissions.

5.2.3 Aldehyde/Ketone

A composite aldehyde/ketone sample was collected for the –86 generator over the five engine load settings, and over one hour for the NF2 light unit. Aldehyde/ketones contributed approximately equal portions of the total HAP emission factor for the NF2 light unit and the –86, approximately 25%. See Table 5-10 for more detailed aldehyde/ketone emission information.

5.3 Fuel Analysis

One composite fuel sample was taken during emission testing. Fuel samples were collected from the fuel supply line and analyzed as outlined in Table 5-11.

TABLE 5-7. AGE TESTING
SCOTT AFB
HAZARDOUS AIR POLLUTANTS (HAPs)
EMISSION FACTOR SUMMARY
Lbs/1000 lbs fuel

	-86 (DG09)	**NF2 (FL08)**
Exhaust Flow, dscfm	344	30
Average Fuel Flow, lbs/hr	5.04	2.00
Pollutant		
Formaldehyde	2.06E-02	2.59E-02
Acetaldehyde	1.93E-02	8.18E-02
Acrolein	**ND**	3.82E-02
Isobutraldehyde, 2-Butanone (MEK)	4.83E-03	2.95E-02
Benzene	3.87E-02	2.18E-01
Bromomethane	3.30E-03	7.04E-04
Toluene	1.88E-02	8.96E-02
Ethylbenzene	1.12E-02	3.33E-02
Methylene chloride	1.03E-02	3.52E-02
m,p-Xylene	2.13E-02	7.68E-02
o-Xylene	8.90E-03	3.65E-02
Propanal	**ND**	1.64E-02
Total HAPs	**0.16**	**0.68**

ND = Not Detected

TABLE 5-8. AGE TESTING
EMISSION FACTOR SUMMARY
VOLATILE ORGANIC COMPOUNDS (VOCs)

		-86 Generator (DG09)				NF2 Light Unit (FL08)			
Flow Rate[a], dscfm	344					30			
Fuel Flow[a], lbs/hr	5.04					2.00			
		lb/hr		lbs/1,000 lbs fuel		lb/hr		lbs/1,000 lbs fuel	
Analyte	**CAS number**	**Detected**	**Detection limit**	**Detected**	**Detection limit**	**Detected**	**Detection limit**	**Detected**	**Detection limit**
Chloromethane[H]	74-87-3		1.28E-06		2.54E-04		1.28E-06		6.40E-04
Bromomethane[H]	74-83-9	1.67E-05		3.30E-03		1.41E-06		7.04E-04	
Chloroethane[H]	75-00-3		1.79E-06		3.56E-04		1.79E-06		8.96E-04
Freon 11 (Trichlorofluoromethane)	75-69-4		1.28E-06		2.54E-04		1.28E-06		6.40E-04
1,1-Dichloroethane[H]	75-34-3		1.79E-06		3.56E-04		1.79E-06		8.96E-04
Carbon Disulfide[H]	75-15-0		1.28E-06		2.54E-04		1.28E-06		6.40E-04
Acetone	67-64-1	1.07E-04		2.12E-02		5.38E-05		2.69E-02	
Methylene Chloride[H]	75-09-2	5.18E-05		1.03E-02		7.05E-05		3.52E-02	
trans-1,2-Dichloroethene	156-60-5		1.79E-06		3.56E-04		1.79E-06		8.96E-04
1,1-Dichloroethene[H]	75-35-4		1.79E-06		3.56E-04		1.79E-06		8.96E-04
Vinyl Acetate[H]	108-05-4		6.41E-06		1.27E-03		6.41E-06		3.20E-03
cis-1,2-Dichloroethene[H]	156-59-2		1.79E-06		3.56E-04		1.79E-06		8.96E-04
2-Butanone (Methyl Ethyl Ketone)[H]	78-93-3	2.43E-05		4.83E-03		5.89E-05		2.95E-02	
Chloroform[H]	67-66-3		1.79E-06		3.56E-04		1.79E-06		8.96E-04
1,1,1-Trichloroethane[H]	71-55-6		1.79E-06		3.56E-04		1.79E-06		8.96E-04
Carbon Tetrachloride[H]	56-23-5		1.28E-06		2.54E-04		1.28E-06		6.40E-04
Benzene[H]	71-43-2	1.95E-04		3.87E-02		4.36E-04		2.18E-02	
1,2-Dichloroethane[H]	107-06-2		1.79E-06		3.56E-04		1.79E-06		8.96E-04
Bromodichloromethane	75-27-4		1.28E-06		2.54E-04		1.28E-06		6.40E-04
cis-1,3-Dichloropropene[H]	10061-01-5		1.79E-06		3.56E-04		1.79E-06		8.96E-04
trans-1,3-Dichloropropene[H]	10061-02-6		1.79E-06		3.56E-04		1.79E-06		8.96E-04
4-Methyl-2-pentanone (MIBK)[H]	108-10-1		6.41E-06		1.27E-03		6.41E-06		3.20E-03
Toluene[H]	108-88-3	9.48E-05		1.88E-02		1.79E-04		8.96E-02	
1,1,2-Trichloroethane[H]	79-00-5		1.79E-06		3.56E-04		1.79E-06		8.96E-04
Tetrachloroethene[H]	127-18-4		1.79E-06		3.56E-04		1.79E-06		8.96E-04
2-Hexanone	591-78-6		6.41E-06		1.27E-03		6.41E-06		3.20E-03

TABLE 5-8 (continued)

		-86 Generator (DG09)				NF2 Light Unit (FL08)			
Flow Rate[a], dscfm		344				30			
Fuel Flow[a], lbs/hr		5.04				2.00			
		lb/hr		**lbs/1,000 lbs fuel**		**lb/hr**		**lbs/1,000 lbs fuel**	
Analyte	**CAS number**	**Detected**	**Detection limit**	**Detected**	**Detection limit**	**Detected**	**Detection limit**	**Detected**	**Detection limit**
Dibromochloromethane	124-48-1		1.79E-06		3.56E-04		1.79E-06		8.96E-04
Chlorobenzene[H]	108-90-7		1.79E-06		3.56E-04		1.79E-06		8.96E-04
Ethyl Benzene[H]	100-41-4	5.64E-05		1.12E-02		6.66E-05		3.33E-02	
m,p-Xylene[H]	108-38-3	1.07E-04		2.13E-02		1.54E-04		7.68E-02	
o-Xylene[H]	95-47-6	4.48E-05		8.90E-03		7.30E-05		3.65E-02	
Styrene[H]	100-42-5		1.28E-06		2.54E-04		1.28E-06		6.40E-04
Bromoform[H]	75-25-2		1.28E-06		2.54E-04		1.28E-06		6.40E-04
1,1,2,2-Tetrachloroethane[H]	79-34-5		1.79E-06		3.56E-04		1.79E-06		8.96E-04
1,3-Butadiene[H]	106-99-0		6.41E-06		1.27E-03		6.41E-06		3.20E-03
1,2-Dichloropropane	78-87-5		1.79E-06		3.56E-04		1.79E-06		8.96E-04
Trichloroethene	79-01-6		1.79E-06		3.56E-04		1.79E-06		8.96E-04

[a]The exhaust flow rate and fuel flow represent a weighted average based upon the amount of sample time spent at each setting.
[H] Hazardous air pollutant (HAP)

TABLE 5-9. AGE TESTING
EMISSION FACTOR SUMMARY
POLYNUCLEAR AROMATIC HYDROCARBONS

		-86 Generator (DG09)				NF2 Light Unit (FL08)			
Flow Rate[a], dscfm		344				30			
Fuel Flow[a], lbs/hr		5.04				2.00			
		lb/hr		**lbs/1,000 lbs fuel**		**lb/hr**		**lbs/1,000 lbs fuel**	
Analyte	**CAS Number**	**Detected**	**Detection Limit**	**Detected**	**Detection Limit**	**Detected**	**Detection Limit**	**Detected**	**Detection Limit**
Naphthalene[H]	91-20-3		1.80E-04		3.56E-02		1.190E-05		5.97E-03
2-Methylnapthlene	91-57-6		1.80E-04		3.56E-02		1.190E-05		5.97E-03
2-Chloronapthalene	91-58-7		1.80E-04		3.56E-02		1.190E-05		5.97E-03
Acenaphthene[H]	83-32-9		1.80E-04		3.56E-02		1.190E-05		5.97E-03
Acenaphthylene[H]	208-96-8		1.80E-04		3.56E-02		1.190E-05		5.97E-03
Fluorene[H]	86-73-7		1.80E-04		3.56E-02		1.190E-05		5.97E-03
Phenanthrene[H]	85-01-8		1.80E-04		3.56E-02		1.190E-05		5.97E-03
Anthracene[H]	120-12-7		1.80E-04		3.56E-02		1.190E-05		5.97E-03
Fluoranthene[H]	206-44-0		1.80E-04		3.56E-02		1.190E-05		5.97E-03
Pyrene[H]	129-00-0		1.80E-04		3.56E-02		1.190E-05		5.97E-03
Chrysene[H]	218-01-9		1.80E-04		3.56E-02		1.190E-05		5.97E-03
Benzo(a)anthracene[H]	56-55-3		1.80E-04		3.56E-02		1.190E-05		5.97E-03
Benzo(b)fluoranthene[H]	205-99-2		1.80E-04		3.56E-02		1.190E-05		5.97E-03
Benzo(k)fluoranthene[H]	207-08-9		1.80E-04		3.56E-02		1.190E-05		5.97E-03
Benzo(a)pyrene[H]	50-32-8		1.80E-04		3.56E-02		1.190E-05		5.97E-03
Indeno(1,2,3-c,d)pyrene[H]	193-3-5		1.80E-04		3.56E-02		1.190E-05		5.97E-03
Dibenzo(a,h)anthracene[H]	53-70-3		1.80E-04		3.56E-02		1.190E-05		5.97E-03
Benzo(g,h,l)perylene[H]	191-24-2		1.80E-04		3.56E-02		1.190E-05		5.97E-03

[a]The exhaust flow rate and fuel flow represent a weighted average based upon the amount of sample time spent at each setting.

[H] - Hazardous Air Pollutant (HAP)

Note: Unless shown as detected, result was less than the reporting limit (<2.0 ug/sample).

TABLE 5-10. AGE TESTING
EMISSION FACTOR SUMMARY
ADELHYDE/KETONES

	-86 Generator (DG09)				NF2 Light Unit (FL08)			
Flow Rate[a], dscfm	344				30			
Fuel Flow[a], lbs/hr	5.04				2.00			
	lb/hr		lbs/1,000 lbs fuel		lb/hr		lbs/1,000 lbs fuel	
Analyte	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit
Formaldehyde[H]	1.04E-03		2.06E-01		5.18E-05		2.59E-01	
Acetaldehyde[H]	9.74E-04		1.93E-01		1.64E-04		8.18E-02	
Acrolein[H]		3.38E-05		6.70E-03	7.64E-05		3.82E-02	
Propanal (Propionaldehyde)[H]		3.38E-05		6.70E-03	3.27E-05		1.64E-02	
Crotonaldehyde	1.17E-04		2.32E-02		3.55E-05		1.77E-02	
Isobutraldehyde / Methyl Ethyl Ketone[H]		3.38E-05		6.70E-03	3.550E-05		1.77E-02	
Benzaldehyde		3.38E-05		6.70E-03	3.00E-05		1.50E-02	
Isopentanal (Isovaleraldehyde)		3.38E-05		6.70E-03		1.50E-05		7.50E-03
Pentanal (Valeraldehyde)		3.38E-05		6.70E-03		1.50E-05		7.50E-03
o-Tolualdehyde		3.38E-05		6.70E-03		1.50E-05		7.50E-03
Hexanal (Hexaldehyde)		3.38E-05		6.70E-03		1.50E-05		7.50E-03
m, p-Tolualdehyde		3.38E-05		6.70E-03		1.50E-05		7.50E-03

[a]The exhaust flow rate and fuel flow represent a weighted average based upon the amount of sample time spent at each setting.
[H] - Hazardous Air Pollutant (HAP)
Note: Unless shown as detected, result was less than the reporting limit (<26 ug/sample for DG09 and <110 ug/sample for FL08).

TABLE 5-11. FUEL ANALYSIS

Parameter	Analytical Method	BioDiesel
Btu/lb	ASTM D-240	19,035
Sulfur %	ASTM D-5453	0.026
Carbon %	ASTM D-5291	84.89
Nitrogen ppm	ASTM 4629	51
Hydrogen %	ASTM D-5291	12.96
Ash %	ASTM D482	0.002
Naphthenes %	PONA Analysis	17.7
Aromatics %	PONA Analysis	37.1
Paraffins %	PONA Analysis	26.6
Olefins %[a]	PONA Analysis	TRACE
Oxygenates[b]	PONA Analysis	18.6

[a]Olefinic hydrocarbons not including unsaturation with methylsoyate.
[b]As methylsoyate

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SECTION 6

QUALITY ASSURANCE PROCEDURES

6.1 Quality Control Procedures

As part of the engine testing program, EQ implemented a quality assurance (QA) and quality control (QC) program. QA/QC are defined as follows:

- Quality Control - The overall system of activities whose purpose is to provide a quality product or service (e.g., the routine application of procedures for obtaining prescribed standards of performance in the monitoring and measurement process).

- Quality Assurance - A system of activities whose purpose is to provide assurance that the overall QC is being conducted effectively.

Field Personnel for stack sampling were responsible for implementation of field QA/QC procedures. Individual laboratory managers were responsible for implementation of analytical QA/QC procedures. The overall Project Manager oversaw all QA/QC procedures to ensure that sampling and analyses met the QA/QC requirements and that accurate data results from the test program were obtained.

Detailed descriptions of these QA/QC procedures are included in the Clean Cam Technology –86 Demonstration Scientific and Technical Emission Summary Test Report, Section 6. Documentation pertaining to QA/QC is found in Appendix D.

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APPENDIX A

EXAMPLE CALCULATIONS

NOMENCLATURE AND DIMENSIONS

An = Cross-sectional area of sampling nozzle, sq.ft.

As = Cross-sectional area of stack, sq.ft.

Bws = Proportion by volume of water vapor in the gas stream, dimensionless

Cp = Pitot tube coefficient, dimensionless

Cs = Concentration of pollutant matter in stack gas – dry basis, grains per standard cubic foot (gr/dscf)

% CO = Percent of carbon monoxide by volume, dry basis

% CO_2 = Percent of carbon dioxide by volume, dry basis

ΔH = Average pressure drop across the sampling meter flow orifice, inches of water (in.H_20)

GCV = Gross calorific value, Btu/lb

I = Percent of isokinetic sampling

La = Maximum acceptable leakage rate for either a pretest leak check or for a leak check following a component change; equal to 0.020 cubic foot per minute or 4% of the average sampling rate, whichever is less

Md = Dry molecular weight, lb/lb-mole

Mn = Total amount of pollutant matter collected, milligrams (mg)

Ms = Molecular weight of stack gas (wet basis), lb/lb-mole

% N_2 = Percent of nitrogen by volume, dry basis

% O_2 = Percent of oxygen by volume, dry basis

ΔP = Velocity head of stack gas, inches of water (in.H_2O)

Pbar = Barometric pressure, inches of mercury (in.Hg)

NOMENCLATURE AND DIMENSIONS (continued)

Ps	=	Absolute stack gas pressure, inches of mercury (in.Hg)
Pstd	=	Gas pressure at standard conditions, inches of mercury (29.92 in.Hg)
pmr	=	Pollutant matter emission rate, pounds per hour (lb/h)
Qs	=	Volumetric flow rate – wet basis at stack conditions, actual cubic feet per minute (acfm)
Qsstd	=	Volumetric flow rate – dry basis at standard conditions, dry standard cubic feet per minute (dscfm)
Tm	=	Average temperature of dry gas meter, °R
Ts	=	Average temperature of stack gas, °R
Tstd	=	Temperature at standard conditions, (528°R)
Vlc	=	Total volume of liquid collected in impingers and silica gel, ml
Vm	=	Volume of dry gas sampled at meter conditions, cu. ft.
Vmstd	=	Volume of dry gas sampled at standard conditions, cu. ft.
Vs	=	Average stack gas velocity at stack conditions, ft/s
Vwstd	=	Volume of water vapor at standard conditions, scf
Y	=	Dry gas meter calibration factor, dimensionless
⌀	=	Total sampling time, minutes

NOTE: Standard condition = 68°F and 29.92 in.Hg

Environmental Quality Management, Inc

EXAMPLE CALCULATIONS FOR POLLUTANT EMISSIONS

1. Volume of dry gas sampled corrected to standard conditions, ft^3.
   Note: Vm must be corrected for leakage if any leakage rates exceed La.

$$Vmstd = 17.647 \; x \, Vm \; x \, Y \left[\frac{Pbar + \frac{\Delta H}{13.6}}{TM, {}^\circ R} \right]$$

2. Volume of water vapor at standard conditions, ft^3.

$$Vwstd = 0.04707 \text{ x } Vlc$$

3. Moisture content in stack gas, dimensionless.

$$Bws = \frac{Vwstd}{Vwstd + Vmstd}$$

4. Dry molecular weight of stack gas, lb/lb-mole.

$$Md = 0.44\,(\%\,CO_2) + 0.32\,(\%\,O_2) + 0.28\,(\%\,N_2 + \%\,CO)$$

5. Molecular weight of stack gas, lb/lb-mole.

$$Ms = Md(1\text{-}Bws) + 18Bws$$

6. Stack velocity at stack conditions, f/s.

$$Vs = (85.49)\,(Cp)\,\left(avg\,\sqrt{\Delta}\,P\right)\sqrt{\frac{Ts, {}^\circ R}{(Ps)(Ms))}}$$

7. Stack gas volumetric flow rate at stack conditions, cfm.

$$Qs = 60 \text{ x } Vs \text{ x } As$$

8. Dry stack gas volumetric flow rate at standard conditions, cfm.

$$Qsstd = (17.647)\,(Qs)\left(\frac{Ps}{Ts}\right)(1 - Bws)$$

EXAMPLE CALCULATIONS FOR POLLUTANT EMISSIONS (continued)

9. Isokinetic Rate, %.

$$Iso = \frac{(0.0945 \times Ts, ^\circ R \times Vmstd)}{(1 - Bws) \times (\theta \times Vs \times Ps \times (0.005454 \times Dn^2))}$$

10. Concentration in gr/dscf.

$$Cs = (0.01543)\left(\frac{Mn}{Vmstd}\right)$$

11. Pollutant mass emission rate, lb/h.

$$\text{pmr, lb / hr} = \left(\frac{\text{Cs}}{7000}\right) \text{x Qsstd x } 60$$

12. Pollutant mass emission rate, lb/MM Btu.

$$\text{pmr, lb / MM Btu} = \left(\frac{\text{pmr, lb/hr}}{\text{MM Btu/hr}}\right)$$

13. F-factor (Fd).

$$\text{Fd} = \frac{10^6 (3.64 \text{ x \% H}) + (1.53 \text{ x \% C}) + (0.57 \text{ x \% S}) + (0.14 \text{ x \% N}) - (0.46 \text{ x \% } O_2)}{\text{GCV (Btu/lb)}}$$

14. F-factor, pollutant mass emission rate, lb/MM Btu (O_2-based).

$$= \frac{\text{lb / dscf x F x } 20.9}{(20.9 - \% \, O_2)}$$

15. Heat input, MM Btu/hr fuel.

$$= \frac{\text{GVC (Btu / lb)} * \text{Feed Rate (lb / hr)}}{10^6}$$

16. Heat input, MM Btu/hr, F-factor.

$$= \frac{\text{Qsstd}}{\text{Fd}} \text{ x } \left[(20.9 - \% \, O_2) + 20.9\right] \text{x } 60$$

Environmental Quality Management, Inc.

EXAMPLE CALCULATIONS FOR GASEOUS POLLUTANTS MEASURED BY CONTINUOUS EMISSION MONITORS (CEMs)

1) Concentrations, parts per million, dry basis:

$$\text{ppm, dry} = \text{ppm, wet basis} \div \left(1 - \frac{\text{BWS,\%}}{100}\right)$$

2) Pollutant Mass Emission Rate, pounds per hour.

$$\text{PMR, lb/hr} = \frac{\text{ppm, dry x Compound Molecular Weight}}{(385.3 \text{ x } 10^6)} \text{ x dscfm x } 60$$

Molecular Weights of Target Compounds

TGO	=	Total Gaseous Organics	16.01 (Methane)
SO_2	=	Sulfur Dioxide	64.05
NO_2	=	Nitrogen Oxides	46.00
CO	=	Carbon Monoxide	28.01
BWS	=	Proportion by Volume of Water Vapor in the Gas Stream	
PMR	=	Pollutant Mass Emission Rate, pounds per hour	
DSCFM	=	Dry standard cubic feet per minute	

HORSE POWER CALCULATIONS

% Load	amps	volts	Fuel Usage	x	kilowatts	HP	lb/hr*hp
10	25	208	21.41	1 732051	8.105998	10 87014	1 969615
25	100	208	26.6	1.732051	32 42399	43 48057	0.611767
50	130	208	40 53	1 732051	42.15119	56.52474	0 717031
75	200	208	50.68	1.732051	64.84798	86.96114	0.582789
100	245	208	49.7	1 732051	79.43878	106.5274	0 466547

CEM – GASEOUS POLLUTANTS
(CO, CO_2, O_2, THC, NO_X) –
-86 Generator

9/8/2003

Run:	10-1			Horsepower:	22		
Flow (dscfm):	360			Fuel Usage (Gal/hr):	3.5		
Moisture (%):	3.7						
Pollutant	NOx	NO	CO	THC	Methane	CO2	O2
Concentration (ppm or %)	1337.00	922.00	36.80	63.14	3.90	4.2	16.2
Mass Rate (lb/hr)	3.43	2.37	0.06	5.64E-02	3.48E-03	--	--
Mass Rate (lb/Gal. Fuel)	9.81E-01	6.76E-01	1.64E-02	1.61E-02	9.95E-04	--	--
Mass Rate (gr/HP*hr)	70.84	48.85	1.19	1.16	0.07	--	--

Run:	10-2			Horsepower:	22		
Flow (dscfm):	343			Fuel Usage (Gal/hr):	3.6		
Moisture (%):	4						
Pollutant	NOx	NO	CO	THC	Methane	CO2	O2
Concentration (ppm or %)	1315.00	885.00	36.40	46.15	3.60	4.2	16.1
Mass Rate (lb/hr)	3.22	2.16	0.05	3.93E-02	3.06E-03	--	--
Mass Rate (lb/Gal. Fuel)	8.94E-01	6.01E-01	1.51E-02	1.09E-02	8.51E-04	--	--
Mass Rate (gr/HP*hr)	66.38	44.67	1.12	0.81	0.06	--	--

Run:	10-3			Horsepower:	22		
Flow (dscfm):	354			Fuel Usage (Gal/hr):	3.8		
Moisture (%):	3.8						
Pollutant	NOx	NO	CO	THC	Methane	CO2	O2
Concentration (ppm or %)	1300.00	856.00	36.10	44.59	3.50	4.1	16.1
Mass Rate (lb/hr)	3.28	2.16	0.06	3.92E-02	3.07E-03	--	--
Mass Rate (lb/Gal. Fuel)	8.64E-01	5.69E-01	1.46E-02	1.03E-02	8.09E-04	--	--
Mass Rate (gr/HP*hr)	67.73	44.60	1.14	0.81	0.06	--	--

9/9/2003

Run:	25-1			Horsepower:	51		
Flow (dscfm):	352			Fuel Usage (Gal/hr):	4.3		
Moisture (%):	4.6						
Pollutant	NOx	NO	CO	THC	Methane	CO2	O2
Concentration (ppm or %)	1411.00	904.00	37.70	49.69	3.20	4.3	15.9
Mass Rate (lb/hr)	3.54	2.27	0.06	4.34E-02	2.79E-03	--	--
Mass Rate (lb/Gal. Fuel)	8.24E-01	5.28E-01	1.34E-02	1.01E-02	6.50E-04	--	--
Mass Rate (gr/HP*hr)	31.53	20.20	0.51	0.39	0.02	--	--

Run:	25-2			Horsepower:	51		
Flow (dscfm):				Fuel Usage (Gal/hr):	4.4		
Moisture (%):							
Pollutant	NOx	NO	CO	THC	Methane	CO2	O2
Concentration (ppm or %)	1494.00	952.00	39.00	45.10	3.00	4.4	15.6
Mass Rate (lb/hr)	0.00	0.00	0.00	0.00E+00	0.00E+00	--	--
Mass Rate (lb/Gal. Fuel)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	--	--
Mass Rate (gr/HP*hr)	0.00	0.00	0.00	0.00	0.00	--	--

Run:	25-3			Horsepower:	51		
Flow (dscfm):				Fuel Usage (Gal/hr):	4.5		
Moisture (%):							
Pollutant	NOx	NO	CO	THC	Methane	CO2	O2
Concentration (ppm or %)	195.30	195.30	98.30	79.10	1.10	4.1	15.2
Mass Rate (lb/hr)	0.00	0.00	0.00	0.00E+00	0.00E+00	--	--
Mass Rate (lb/Gal. Fuel)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	--	--
Mass Rate (gr/HP*hr)	0.00	0.00	0.00	0.00	0.00	--	--

9/9/2003

Run:	50-1			Horsepower:	81.4		
Flow (dscfm):	347			Fuel Usage (Gal/hr):	5.1		
Moisture (%):	5.2						
Pollutant	NOx	NO	CO	THC	Methane	CO2	O2
Concentration (ppm or %)	1730.00	1149.00	43.40	52.00	0.40	4.9	14.7
Mass Rate (lb/hr)	4.28	2.84	0.07	4.48E-02	3.44E-04	--	--
Mass Rate (lb/Gal. Fuel)	8.39E-01	5.58E-01	1.28E-02	8.78E-03	6.75E-05	--	--
Mass Rate (gr/HP*hr)	23.88	15.86	0.36	0.25	0.00	--	--

Run:	50-2			Horsepower:	81.4		
Flow (dscfm):	354			Fuel Usage (Gal/hr):	5		
Moisture (%):	4.3						
Pollutant	NOx	NO	CO	THC	Methane	CO2	O2
Concentration (ppm or %)	1752.00	1168.00	43.00	48.69	0.40	4.9	14.6
Mass Rate (lb/hr)	4.42	2.95	0.07	4.27E-02	3.51E-04	--	--
Mass Rate (lb/Gal. Fuel)	8.85E-01	5.90E-01	1.32E-02	8.55E-03	6.89E-05	--	--
Mass Rate (gr/HP*hr)	24.67	16.45	0.37	0.24	0.00	--	--

Run:	50-3			Horsepower:	81.4		
Flow (dscfm):	352			Fuel Usage (Gal/hr):	4.95		
Moisture (%):	4.7						
Pollutant	NOx	NO	CO	THC	Methane	CO2	O2
Concentration (ppm or %)	1741.00	1245.00	42.40	44.07	0.20	4.8	14.7
Mass Rate (lb/hr)	4.37	3.13	0.06	3.85E-02	1.75E-04	--	--
Mass Rate (lb/Gal. Fuel)	8.83E-01	6.31E-01	1.31E-02	7.77E-03	3.53E-05	--	--
Mass Rate (gr/HP*hr)	24.38	17.43	0.36	0.21	0.00	--	--

9/9/2003

Run:	75-1			Horsepower:	116		
Flow (dscfm):	347			Fuel Usage (Gal/hr):	6.35		
Moisture (%):	6.4						
Pollutant	NOx	NO	CO	THC	Methane	CO2	O2
Concentration (ppm or %)	2310.00	1517.00	81.10	55.02	0.10	6.2	12.8
Mass Rate (lb/hr)	5.72	3.75	0.12	4.73E-02	8.61E-05	--	--
Mass Rate (lb/Gal. Fuel)	9.00E-01	5.91E-01	1.92E-02	7.46E-03	1.36E-05	--	--
Mass Rate (gr/HP*hr)	22.37	14.69	0.48	0.19	0.00	--	--

Run:	75-2			Horsepower:	116		
Flow (dscfm):	343			Fuel Usage (Gal/hr):	6.44		
Moisture (%):	6.5						
Pollutant	NOx	NO	CO	THC	Methane	CO2	O2
Concentration (ppm or %)	2308.00	1517.00	76.20	40.00	0.00	6.2	12.8
Mass Rate (lb/hr)	5.65	3.71	0.11	3.40E-02	0.00E+00	--	--
Mass Rate (lb/Gal. Fuel)	8.77E-01	5.76E-01	1.76E-02	5.28E-03	0.00E+00	--	--
Mass Rate (gr/HP*hr)	22.10	14.52	0.44	0.13	0.00	--	--

Run:	75-3			Horsepower:	116		
Flow (dscfm):	343			Fuel Usage (Gal/hr):	6.38		
Moisture (%):	6.3						
Pollutant	NOx	NO	CO	THC	Methane	CO2	O2
Concentration (ppm or %)	2224.00	1461.00	73.10	40.77	0.00	6.1	12.9
Mass Rate (lb/hr)	5.44	3.57	0.11	3.47E-02	0.00E+00	--	--
Mass Rate (lb/Gal. Fuel)	8.53E-01	5.60E-01	1.71E-02	5.44E-03	0.00E+00	--	--
Mass Rate (gr/HP*hr)	21.29	13.99	0.43	0.14	0.00	--	--

9/10/2003

Run: 100-1				Horsepower: 120			
Flow (dscfm): 359				Fuel Usage (Gal/hr): 5.95			
Moisture (%): 5.6							
Pollutant	NOx	NO	CO	THC	Methane	CO2	O2
Concentration (ppm or %)	2041.00	1262.00	42.90	38.67	0.00	5.4	13.7
Mass Rate (lb/hr)	5.23	3.23	0.07	3.44E-02	0.00E+00	--	--
Mass Rate (lb/Gal. Fuel)	8.78E-01	5.43E-01	1.12E-02	5.79E-03	0.00E+00	--	--
Mass Rate (gr/HP*hr)	19.77	12.22	0.25	0.13	0.00	--	--

Run: 100-2				Horsepower: 120			
Flow (dscfm): 342				Fuel Usage (Gal/hr): 5.55			
Moisture (%): 5.8							
Pollutant	NOx	NO	CO	THC	Methane	CO2	O2
Concentration (ppm or %)	2000.00	1377.00	45.50	43.52	0.00	5.6	13.3
Mass Rate (lb/hr)	4.88	3.36	0.07	3.69E-02	0.00E+00	--	--
Mass Rate (lb/Gal. Fuel)	8.79E-01	6.05E-01	1.22E-02	6.65E-03	0.00E+00	--	--
Mass Rate (gr/HP*hr)	18.46	12.71	0.26	0.14	0.00	--	--

Run: 100-3				Horsepower: 120			
Flow (dscfm): 333				Fuel Usage (Gal/hr): 6.9			
Moisture (%): 5.8							
Pollutant	NOx	NO	CO	THC	Methane	CO2	O2
Concentration (ppm or %)	2004.00	1368.00	45.80	44.90	0.00	5.6	13.6
Mass Rate (lb/hr)	4.76	3.25	0.07	3.71E-02	0.00E+00	--	--
Mass Rate (lb/Gal. Fuel)	6.90E-01	4.71E-01	9.59E-03	5.37E-03	0.00E+00	--	--
Mass Rate (gr/HP*hr)	18.01	12.29	0.25	0.14	0.00	--	--

CEM – GASEOUS POLLUTANTS
(CO, CO_2, O_2, THC, NO_X) -
NF2 Lighting Unit AGE

9/10/2003

Run:	L-1			Horsepower:	20		
Flow (dscfm):	30			Fuel Usage (Gal/hr):	0.27		
Moisture (%):	3.5						
Pollutant	NOx	NO	CO	THC	Methane	CO2	O2
Concentration (ppm or %)	277.60	192.00	181.40	36.58	0.00	4.1	14.9
Mass Rate (lb/hr)	0.06	0.04	0.02	2.72E-03	0.00E+00	--	--
Mass Rate (lb/Gal. Fuel)	2.20E-01	1.52E-01	8.75E-02	1.01E-02	0.00E+00	--	--
Mass Rate (gr/HP*hr)	1.35	0.93	0.54	0.06	0.00	--	--

Run:	L-2			Horsepower:	20		
Flow (dscfm):	42			Fuel Usage (Gal/hr):	0.27		
Moisture (%):	5.3						
Pollutant	NOx	NO	CO	THC	Methane	CO2	O2
Concentration (ppm or %)	243.00	198.10	180.90	38.01	0.00	4.1	15.1
Mass Rate (lb/hr)	0.07	0.06	0.03	3.96E-03	0.00E+00	--	--
Mass Rate (lb/Gal. Fuel)	2.70E-01	2.20E-01	1.22E-01	1.47E-02	0.00E+00	--	--
Mass Rate (gr/HP*hr)	1.65	1.35	0.75	0.09	0.00	--	--

Run:	L-3			Horsepower:	20		
Flow (dscfm):	30			Fuel Usage (Gal/hr):	0.27		
Moisture (%):	5						
Pollutant	NOx	NO	CO	THC	Methane	CO2	O2
Concentration (ppm or %)	261.10	196.80	176.40	36.63	0.00	4.3	15.3
Mass Rate (lb/hr)	0.06	0.04	0.02	2.73E-03	0.00E+00	--	--
Mass Rate (lb/Gal. Fuel)	2.07E-01	1.56E-01	8.51E-02	1.01E-02	0.00E+00	--	--
Mass Rate (gr/HP*hr)	1.27	0.96	0.52	0.06	0.00	--	--

PARTICULATE
-86 GENERATOR

Summary of Stack Gas Parameters and Test Results
Generator Testing
Scott AFB
US EPA Test Method 5 - Particulate Matter
Generator - 10% Loading
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	RUN NUMBER	***10-5-1***	***10-5-2***	***10-5-3***	
	RUN DATE	***9/8/2003***	***9/8/2003***	***9/8/2003***	***Average***
	RUN TIME	***1513-1613***	***1637-1737***	***1752-1852***	
	MEASURED DATA				
P_{static}	Stack Static Pressure, inches H_2O	4 60	3.50	3.50	3 87
y	Meter Box Correction Factor	1 006	1 006	1.006	1 006
P_{bar}	Barometric Pressure, inches Hg	30 65	30 65	30 65	30 65
V_m	Sample Volume, ft^3	49 829	48 547	43 733	47 370
$Dp^{1/2}$	Average Square Root Dp, (in $H_2O)^{1/2}$	1.2688	1.3693	1.4101	1.3494
DH	Avg Meter Orifice Pressure, in H_2O	2.20	2 13	1.60	1 98
T_m	Average Meter Temperature, °F	88	91	92	90
T_s	Average Stack Temperature, °F	300	449	510	420
V_{lc}	Condensate Collected, ml	40 4	42 9	36 7	40 0
CO_2	Carbon Dioxide content, % by volume	4 2	4.2	4 1	4.2
O_2	Oxygen content, % by volume	16.2	16 1	16 1	16.1
N_2	Nitrogen content, % by volume	79 6	79 7	79.8	79 7
C_p	Pitot Tube Coefficient	0 99	0 99	0.99	0 99
	Circular Stack? 1=Y,0=N	1	1	1	
As	Diameter or Dimensions, inches	4 00	4 00	4 00	4 00
Q	Sample Run Duration, minutes	60	60	60	60
D_n	Nozzle Diameter, inches	0 195	0 195	0 183	0 191
	CALCULATED DATA				
A_n	Nozzle Area, ft^2	0 000207	0 000207	0 000183	0 000199
$V_{m(std)}$	Standard Meter Volume, ft^3	49 718	48.211	43.297	47.075
$V_{m(std)}$	Standard Meter Volume, m^3	1 408	1.365	1.226	1.333
Q_m	Average Sampling Rate, dscfm	0 829	0 804	0 722	0 785
P_s	Stack Pressure, inches Hg	30.99	30.91	30 91	30 93
B_{ws}	Moisture, % by volume	3 7	4 0	3.8	3.8
$B_{ws(sat)}$	Moisture (at saturation), % by volume	445 6	2867.2	5139 7	2817 5
V_{wstd}	Standard Water Vapor Volume, ft^3	1 902	2.019	1 727	1 883
$1-B_{ws}$	Dry Mole Fraction	0 963	0 960	0 962	0.962
M_d	Molecular Weight (d b), lb/lb•mole	29.32	29.32	29 30	29 31
M_s	Molecular Weight (w b), lb/lb•mole	28 90	28.86	28 87	28 88
V_s	Stack Gas Velocity, ft/s	98 9	117 0	124.4	113.4
A	Stack Area, ft^2	0.1	0 1	0.1	0.09
Q_a	Stack Gas Volumetric flow, acfm	518	613	652	594
Q_s	Stack Gas Volumetric flow, dscfm	359	353	352	355
Q_s	Stack Gas Volumetric flow, dscmm	10	10	10	10
I	Isokinetic Sampling Ratio, %	97.2	95.9	97.9	97.0

Summary of Stack Gas Parameters and Test Results
Generator Testing
Scott AFB
US EPA Test Method 5 - Particulate Matter
Generator - 10% Loading

	RUN NUMBER	***10-5-1***	***10-5-2***	***10-5-3***	
	RUN DATE	***9/8/2003***	***9/8/2003***	***9/8/2003***	***Average***
	RUN TIME	***1513-1613***	***1637-1737***	***1752-1852***	
	EMISSIONS DATA				
	Particulate Matter				
PM	Filter Weight Gain, mg	12.2	5.9	8.45	
PM	Beaker Weight Gain, mg	11.65	11.75	13.8	
PM	Total Catch, g	0 0239	0 0177	0.0223	0 0213
C_{PM}	**Concentration, gr/dscf**	**7.40E-03**	**5.65E-03**	**7.93E-03**	**6.99E-03**
C_{PM}	**Concentration, lb/dscf**	**1.06E-06**	**8.07E-07**	**1.13E-06**	**9.99E-07**
E_{PM}	**Emission Rate, lb/hr**	**2.28E-02**	**1.71E-02**	**2.39E-02**	**2.13E-02**
	Condensible Matter				
PM	Organic Gain, mg	12.3	12.2	12.4	
PM	Aqueous Gain, mg	19.3	14	18.9	
PM	Total Catch, g	0 0316	0 0262	0 0313	0.03
C_{PM}	**Concentration, gr/dscf**	**9.81E-03**	**8.39E-03**	**1.12E-02**	**9.78E-03**
C_{PM}	**Concentration, lb/dscf**	**1.40E-06**	**1.20E-06**	**1.59E-06**	**1.40E-06**
E_{PM}	**Emission Rate, lb/hr**	**3.02E-02**	**2.53E-02**	**3.37E-02**	**2.97E-02**
	Total Particulate Matter				
PM	Total Catch, g	5 55E-02	4.39E-02	5 36E-02	0.05
C_{PM}	**Concentration, gr/dscf**	**1.72E-02**	**1.40E-02**	**1.91E-02**	**1.68E-02**
C_{PM}	**Concentration, lb/dscf**	**2.46E-06**	**2.01E-06**	**2.73E-06**	**2.40E-06**
E_{PM}	**Emission Rate, lb/hr**	**5.29E-02**	**4.24E-02**	**5.76E-02**	**0.05**

Summary of Stack Gas Parameters and Test Results
Generator Testing
Scott AFB
US EPA Test Method 5 - Particulate Matter
Generator - 25% Loading
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	RUN NUMBER	***25-5-1***	***25-5-2***	***25-5-3***	
	RUN DATE	***9/9/2003***	***9/9/2003***	***9/9/2003***	***Average***
	RUN TIME	***0809-0909***	***0925-1025***	***1042-1142***	
	MEASURED DATA				
P_{static}	Stack Static Pressure, inches H_2O	9 00	2.50	2 50	4.67
y	Meter Box Correction Factor	1 006	1 006	1 006	1 006
P_{bar}	Barometric Pressure, inches Hg	30 69	30 69	30 69	30 69
V_m	Sample Volume, ft^3	45 611	42 175	44.423	44 070
$Dp^{1/2}$	Average Square Root Dp, (in $H_2O)^{1/2}$	1.4177	1 4403	1.4572	1.4384
DH	Avg Meter Orifice Pressure, in H_2O	1.90	1.65	1 70	1.75
T_m	Average Meter Temperature, °F	69	78	88	78
T_s	Average Stack Temperature, °F	523	523	549	532
V_{lc}	Condensate Collected, ml	48 3	44 8	51 7	48 3
CO_2	Carbon Dioxide content, % by volume	4 3	4.4	4 1	4.3
O_2	Oxygen content, % by volume	15 9	15 6	15.2	15 6
N_2	Nitrogen content, % by volume	79 8	80 0	80 7	80 2
C_p	Pitot Tube Coefficient	0.99	0 99	0 99	0.99
	Circular Stack? 1=Y,0=N	1	1	1	
As	Diameter or Dimensions, inches	4 00	4 00	4 00	4 00
Q	Sample Run Duration, minutes	60	60	60	60
D_n	Nozzle Diameter, inches	0 195	0 183	0 183	0 187
	CALCULATED DATA				
A_n	Nozzle Area, ft^2	0 000207	0 000183	0 000183	0 000191
$V_{m(std)}$	Standard Meter Volume, ft^3	47 172	42 863	44 329	44 788
$V_{m(std)}$	Standard Meter Volume, m^3	1.336	1.214	1.255	1.268
Q_m	Average Sampling Rate, dscfm	0 786	0 714	0 739	0 746
P_s	Stack Pressure, inches Hg	31 35	30 87	30.87	31 03
B_{ws}	Moisture, % by volume	4 6	4 7	5.2	4 8
$B_{ws(sat)}$	Moisture (at saturation), % by volume	5680.5	5768.4	7181 8	6210 2
V_{wstd}	Standard Water Vapor Volume, ft^3	2.273	2 109	2.434	2 272
$1\text{-}B_{ws}$	Dry Mole Fraction	0 954	0 953	0 948	0 952
M_d	Molecular Weight (d b), lb/lb•mole	29.32	29 33	29.26	29.31
M_s	Molecular Weight (w.b), lb/lb•mole	28 80	28 80	28 68	28 76
V_s	Stack Gas Velocity, ft/s	125.2	128.2	131 7	128 3
A	Stack Area, ft^2	0.1	0.1	0.1	0.09
Q_a	Stack Gas Volumetric flow, acfm	655	671	689	672
Q_s	Stack Gas Volumetric flow, dscfm	352	354	353	353
Q_s	Stack Gas Volumetric flow, dscmm	10	10	10	10
I	Isokinetic Sampling Ratio, %	94.0	96.3	100.1	96.8

Summary of Stack Gas Parameters and Test Results
Generator Testing
Scott AFB
US EPA Test Method 5 - Particulate Matter
Generator - 25% Loading

	RUN NUMBER	***25-5-1***	***25-5-2***	***25-5-3***	
	RUN DATE	***9/9/2003***	***9/9/2003***	***9/9/2003***	***Average***
	RUN TIME	***0809-0909***	***0925-1025***	***1042-1142***	
	EMISSIONS DATA				
	Particulate Matter				
PM	Filter Weight Gain, mg	12.85	5 85	11.95	
PM	Beaker Weight Gain, mg	23.6	22.85	15.5	
PM	Total Catch, g	0 0365	0 0287	0.0275	0 0309
C_{PM}	**Concentration, gr/dscf**	**1.19E-02**	**1.03E-02**	**9.56E-03**	**1.06E-02**
C_{PM}	**Concentration, lb/dscf**	**1.70E-06**	**1.48E-06**	**1.37E-06**	**1.51E-06**
E_{PM}	**Emission Rate, lb/hr**	**3.60E-02**	**3.14E-02**	**2.89E-02**	**3.21E-02**
	Condensible Matter				
PM	Organic Gain, mg	12 5	10 7	12	
PM	Aqueous Gain, mg	15.3	12.3	23.7	
PM	Total Catch, g	0 0278	0 0230	0 0357	0.03
C_{PM}	**Concentration, gr/dscf**	**9.09E-03**	**8.28E-03**	**1.24E-02**	**9.93E-03**
C_{PM}	**Concentration, lb/dscf**	**1.30E-06**	**1.18E-06**	**1.78E-06**	**1.42E-06**
E_{PM}	**Emission Rate, lb/hr**	**2.74E-02**	**2.52E-02**	**3.76E-02**	**3.01E-02**
	Total Particulate Matter				
PM	Total Catch, g	6.43E-02	5 17E-02	6 32E-02	0.06
C_{PM}	**Concentration, gr/dscf**	**2.10E-02**	**1.86E-02**	**2.20E-02**	**2.05E-02**
C_{PM}	**Concentration, lb/dscf**	**3.00E-06**	**2.66E-06**	**3.14E-06**	**2.93E-06**
E_{PM}	**Emission Rate, lb/hr**	**6.34E-02**	**5.65E-02**	**6.65E-02**	**0.06**

Summary of Stack Gas Parameters and Test Results
Generator Testing
Scott AFB
US EPA Test Method 5 - Particulate Matter
Generator - 50% Loading
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	RUN NUMBER	***50-5-1***	***50-5-2***	***50-5-3***	
	RUN DATE	***9/9/2003***	***9/9/2003***	***9/9/2003***	***Average***
	RUN TIME	***1155-1255***	***1310-1410***	***1424-1524***	
	MEASURED DATA				
P_{static}	Stack Static Pressure, inches H_2O	3 50	3 50	4 00	3 67
y	Meter Box Correction Factor	1 006	1 006	1 006	1 006
P_{bar}	Barometric Pressure, inches Hg	30 69	30 69	30 69	30.69
V_m	Sample Volume, ft^3	43 904	8 996	44 623	32.508
$Dp^{1/2}$	Average Square Root Dp, (in $H_2O)^{1/2}$	1.4830	1.5000	1.5000	1.4943
DH	Avg Meter Orifice Pressure, in H_2O	1 66	0 16	1 68	1 17
T_m	Average Meter Temperature, °F	91	89	94	91
T_s	Average Stack Temperature, °F	595	617	620	611
V_{lc}	Condensate Collected, ml	50 1	8.5	46.4	35 0
CO_2	Carbon Dioxide content, % by volume	4 9	4 9	4.8	4 9
O_2	Oxygen content, % by volume	14 7	14 6	14 7	14.7
N_2	Nitrogen content, % by volume	80.4	80.5	80 5	80 5
C_p	Pitot Tube Coefficient	0 99	0 99	0 99	0 99
	Circular Stack? 1=Y,0=N:	1	1	1	
As	Diameter or Dimensions, inches	4 00	4 00	4 00	4 00
Q	Sample Run Duration, minutes	60	60	60	60
D_n	Nozzle Diameter, inches	0.183	0 120	0 183	0 162
	CALCULATED DATA				
A_n	Nozzle Area, ft^2	0 000183	0 000079	0 000183	0 000148
$V_{m(std)}$	Standard Meter Volume, ft^3	43.568	8 928	44 044	32 180
$V_{m(std)}$	Standard Meter Volume, m^3	1.234	0.253	1.247	0 911
Q_m	Average Sampling Rate, dscfm	0 726	0 149	0 734	0.536
P_s	Stack Pressure, inches Hg	30.95	30 95	30 98	30 96
B_{ws}	Moisture, % by volume	5 1	4 3	4 7	4 7
$B_{ws(sat)}$	Moisture (at saturation), % by volume	10263 2	12047 5	12292.4	11534 4
V_{wstd}	Standard Water Vapor Volume, ft^3	2 358	0.400	2 184	1 647
$1-B_{ws}$	Dry Mole Fraction	0 949	0.957	0 953	0.953
M_d	Molecular Weight (d b), lb/lb•mole	29 37	29 37	29.36	29 37
M_s	Molecular Weight (w b), lb/lb•mole	28 79	28 88	28 82	28 83
V_s	Stack Gas Velocity, ft/s	136 6	139.4	139 6	138.5
A	Stack Area, ft^2	0 1	0.1	0.1	0.09
Q_a	Stack Gas Volumetric flow, acfm	715	730	731	725
Q_s	Stack Gas Volumetric flow, dscfm	351	354	352	353
Q_s	Stack Gas Volumetric flow, dscmm	10	10	10	10
I	Isokinetic Sampling Ratio, %	98.8	46.7	99.5	81.7

Summary of Stack Gas Parameters and Test Results
Generator Testing
Scott AFB
US EPA Test Method 5 - Particulate Matter
Generator - 50% Loading

	RUN NUMBER	***50-5-1***	***50-5-2***	***50-5-3***	
	RUN DATE	***9/9/2003***	***9/9/2003***	***9/9/2003***	***Average***
	RUN TIME	***1155-1255***	***1310-1410***	***1424-1524***	
	EMISSIONS DATA				
	Particulate Matter				
PM	Filter Weight Gain, mg	16 4	2 55	14 05	
PM	Beaker Weight Gain, mg	25.7	12.85	34.7	
PM	Total Catch, g	0 0421	0 0154	0 0488	0 0354
C_{PM}	**Concentration, gr/dscf**	**1.49E-02**	**2.66E-02**	**1.71E-02**	**1.95E-02**
C_{PM}	**Concentration, lb/dscf**	**2.13E-06**	**3.80E-06**	**2.44E-06**	**2.79E-06**
E_{PM}	**Emission Rate, lb/hr**	**4.49E-02**	**8.08E-02**	**5.16E-02**	**5.91E-02**
	Condensible Matter				
PM	Organic Gain, mg	11.3	3.4	12.6	
PM	Aqueous Gain, mg	33.5	7.5	33.8	
PM	Total Catch, g	0 0448	0 0109	0.0464	0.03
C_{PM}	**Concentration, gr/dscf**	**1.59E-02**	**1.88E-02**	**1.63E-02**	**1.70E-02**
C_{PM}	**Concentration, lb/dscf**	**2.27E-06**	**2.69E-06**	**2.32E-06**	**2.43E-06**
E_{PM}	**Emission Rate, lb/hr**	**4.77E-02**	**5.72E-02**	**4.91E-02**	**5.13E-02**
	Total Particulate Matter				
PM	Total Catch, g	8 69E-02	2 63E-02	9 52E-02	0.07
C_{PM}	**Concentration, gr/dscf**	**3.08E-02**	**4.55E-02**	**3.33E-02**	**3.65E-02**
C_{PM}	**Concentration, lb/dscf**	**4.40E-06**	**6.49E-06**	**4.76E-06**	**5.22E-06**
E_{PM}	**Emission Rate, lb/hr**	**9.26E-02**	**1.38E-01**	**1.01E-01**	**0.11**

Summary of Stack Gas Parameters and Test Results
Generator Testing
Scott AFB
US EPA Test Method 5 - Particulate Matter
Generator - 75% Loading
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	RUN NUMBER	***75-5-1***	***75-5-2***	***75-5-3***	
	RUN DATE	***9/9/2003***	***9/9/2003***	***9/9/2003***	***Average***
	RUN TIME	***1540-1640***	***1652-1707***	***1725-1825***	
	MEASURED DATA				
P_{static}	Stack Static Pressure, inches H_2O	5 00	4.50	4.50	4.67
y	Meter Box Correction Factor	1 006	1 006	1 006	1 006
P_{bar}	Barometric Pressure, inches Hg	30.69	30.69	30.69	30 69
V_m	Sample Volume, ft^3	44 648	7.694	43.054	31 799
$Dp^{1/2}$	Average Square Root Dp, (in $H_2O)^{1/2}$	1.5000	1 5684	1.5684	1.5456
DH	Avg Meter Orifice Pressure, in H_2O	1 70	1 18	1.60	1.49
T_m	Average Meter Temperature, °F	96	93	93	94
T_s	Average Stack Temperature, °F	620	750	750	707
V_{lc}	Condensate Collected, ml	63.4	11 2	61 1	45.2
CO_2	Carbon Dioxide content, % by volume	6.2	6.2	6 1	6 2
O_2	Oxygen content, % by volume	12.8	12 8	12.9	12.8
N_2	Nitrogen content, % by volume	81 0	81 0	81 0	81 0
C_p	Pitot Tube Coefficient	0 99	0 99	0 99	0.99
	Circular Stack? 1=Y,0=N:	1	1	1	
As	Diameter or Dimensions, inches:	4 00	4 00	4.00	4 00
Q	Sample Run Duration, minutes	60	15	60	45
D_n	Nozzle Diameter, inches	0 183	0 183	0 183	0 183
	CALCULATED DATA				
A_n	Nozzle Area, ft^2	0 000183	0.000183	0 000183	0 000183
$V_{m(std)}$	Standard Meter Volume, ft^3	43 952	7 606	42 564	31.374
$V_{m(std)}$	Standard Meter Volume, m^3	1.245	0.215	1.205	0 888
Q_m	Average Sampling Rate, dscfm	0 733	0.507	0 709	0 650
P_s	Stack Pressure, inches Hg	31 06	31 02	31 02	31 03
B_{ws}	Moisture, % by volume	6 4	6.5	6.3	6.4
$B_{ws(sat)}$	Moisture (at saturation), % by volume	12263 3	27767 1	27767 1	22599.2
V_{wstd}	Standard Water Vapor Volume, ft^3	2 984	0 527	2.876	2 129
$1\text{-}B_{ws}$	Dry Mole Fraction	0 936	0 935	0 937	0.936
M_d	Molecular Weight (d b), lb/lb•mole	29.50	29 50	29.49	29.50
M_s	Molecular Weight (w b), lb/lb•mole	28 77	28 76	28 76	28 77
V_s	Stack Gas Velocity, ft/s	139 6	154 6	154.6	149 6
A	Stack Area, ft^2	0.1	0.1	0.1	0.09
Q_a	Stack Gas Volumetric flow, acfm	731	809	809	783
Q_s	Stack Gas Volumetric flow, dscfm	347	342	343	344
Q_s	Stack Gas Volumetric flow, dscmm	10	10	10	10
I	Isokinetic Sampling Ratio, %	100.8	70.8	98.9	90.2

Summary of Stack Gas Parameters and Test Results
Generator Testing
Scott AFB
US EPA Test Method 5 - Particulate Matter
Generator - 75% Loading

	RUN NUMBER	***75-5-1***	***75-5-2***	***75-5-3***	
	RUN DATE	***9/9/2003***	***9/9/2003***	***9/9/2003***	***Average***
	RUN TIME	***1540-1640***	***1652-1707***	***1725-1825***	
	EMISSIONS DATA				
	Particulate Matter				
PM	Filter Weight Gain, mg	50.55	3 6	9.2	
PM	Beaker Weight Gain, mg	28.15	11.9	17.45	
PM	Total Catch, g	0 0787	0.0155	0 0267	0 0403
C_{PM}	**Concentration, gr/dscf**	**2.76E-02**	**3.15E-02**	**9.66E-03**	**2.29E-02**
C_{PM}	**Concentration, lb/dscf**	**3.95E-06**	**4.49E-06**	**1.38E-06**	**3.27E-06**
E_{PM}	**Emission Rate, lb/hr**	**8.22E-02**	**9.23E-02**	**2.84E-02**	**6.76E-02**
	Condensible Matter				
PM	Organic Gain, mg	1 9	2 7	17	
PM	Aqueous Gain, mg	39.7	5.7	36.6	
PM	Total Catch, g	0.0416	0 0084	0 0536	0.03
C_{PM}	**Concentration, gr/dscf**	**1.46E-02**	**1.70E-02**	**1.94E-02**	**1.70E-02**
C_{PM}	**Concentration, lb/dscf**	**2.09E-06**	**2.43E-06**	**2.78E-06**	**2.43E-06**
E_{PM}	**Emission Rate, lb/hr**	**4.35E-02**	**5.00E-02**	**5.71E-02**	**5.02E-02**
	Total Particulate Matter				
PM	Total Catch, g	1.20E-01	2 39E-02	8 03E-02	0.07
C_{PM}	**Concentration, gr/dscf**	**4.22E-02**	**4.85E-02**	**2.91E-02**	**3.99E-02**
C_{PM}	**Concentration, lb/dscf**	**6.03E-06**	**6.93E-06**	**4.16E-06**	**5.71E-06**
E_{PM}	**Emission Rate, lb/hr**	**1.26E-01**	**1.42E-01**	**8.55E-02**	**0.12**

Summary of Stack Gas Parameters and Test Results
Generator Testing
Scott AFB
US EPA Test Method 5 - Particulate Matter
Generator - 100% Loading
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	RUN NUMBER	***100-5-1***	***100-5-2***	***100-5-3***	***100-5-4***	
	RUN DATE	***9/10/2003***	***9/10/2003***	***9/10/2003***	***9/10/2003***	***Average***
	RUN TIME	***0758-0858***	***0910-0925***	***0945-1045***	***1058-1158***	
	MEASURED DATA					
P_{static}	Stack Static Pressure, inches H_2O	4 00	4 00	5.00	5.50	4 63
y	Meter Box Correction Factor	1.006	1 006	1 006	1 006	1 006
P_{bar}	Barometric Pressure, inches Hg	30.68	30.68	30.68	30.68	30.68
V_m	Sample Volume, ft^3	42.285	6.751	42.617	42.196	33 462
$Dp^{1/2}$	Average Square Root Dp, (in $H_2O)^{1/2}$	1 5692	1.5716	1.5122	1.4697	1 5307
DH	Avg Meter Orifice Pressure, in. H_2O	1.58	0.88	1 58	1 50	1 38
T_m	Average Meter Temperature, °F	69	74	83	90	79
T_s	Average Stack Temperature, °F	728	661	674	683	687
V_{lc}	Condensate Collected, ml	54 7	3 3	55 3	55 0	42 1
CO_2	Carbon Dioxide content, % by volume	5 4	5 4	5.6	5 6	5.5
O_2	Oxygen content, % by volume	13 7	13 7	13.3	13.6	13.6
N_2	Nitrogen content, % by volume	80 9	80 9	81 1	80 8	80 9
C_p	Pitot Tube Coefficient	0 99	0 99	0 99	0 99	0 99
	Circular Stack? 1=Y,0=N·	1	1	1	1	
As	Diameter or Dimensions, inches:	4 00	4 00	4 00	4 00	4 00
Q	Sample Run Duration, minutes	60	15	60	60	49
D_n	Nozzle Diameter, inches	0 183	0 183	0 183	0 183	0 183
	CALCULATED DATA					
A_n	Nozzle Area, ft^2	0 000183	0 000183	0 000183	0.000183	0 000183
$V_{m(std)}$	Standard Meter Volume, ft^3	43 692	6 898	42 892	41 927	33.852
$V_{m(std)}$	Standard Meter Volume, m^3	1.237	0 195	1.215	1 187	0 959
Q_m	Average Sampling Rate, dscfm	0 728	0 460	0.715	0.699	0.650
P_s	Stack Pressure, inches Hg	30 97	30 97	31 05	31 08	31 02
B_{ws}	Moisture, % by volume	5 6	2.2	5 7	5.8	4 8
$B_{ws(sat)}$	Moisture (at saturation), % by volume	24547 0	16255 9	17638.9	18651.0	19273.2
V_{wstd}	Standard Water Vapor Volume, ft^3	2 575	0 155	2 603	2.589	1 980
$1\text{-}B_{ws}$	Dry Mole Fraction	0 944	0.978	0 943	0.942	0 952
M_d	Molecular Weight (d b), lb/lb•mole	29.41	29 41	29.43	29 44	29.42
M_s	Molecular Weight (w b), lb/lb•mole	28 78	29 16	28 77	28 77	28.87
V_s	Stack Gas Velocity, ft/s	153.3	148.2	144 2	140 6	146 6
A	Stack Area, ft^2	0.1	0.1	0.1	0.1	0.09
Q_a	Stack Gas Volumetric flow, acfm	803	776	755	736	767
Q_s	Stack Gas Volumetric flow, dscfm	349	370	344	333	349
Q_s	Stack Gas Volumetric flow, dscmm	10	10	10	9	10
I	Isokinetic Sampling Ratio, %	99.8	59.4	99.4	100.4	89.7

Summary of Stack Gas Parameters and Test Results
Generator Testing
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Generator - 100% Loading
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	RUN NUMBER	***100-5-1***	***100-5-2***	***100-5-3***	***100-5-4***	
	RUN DATE	***9/10/2003***	***9/10/2003***	***9/10/2003***	***9/10/2003***	***Average***
	RUN TIME	***0758-0858***	***0910-0925***	***0945-1045***	***1058-1158***	
	EMISSIONS DATA					
	Particulate Matter					
PM	Filter Weight Gain, mg	2 75	4.65	3.65	3.35	
PM	Beaker Weight Gain, mg	8.85	5.5	9.2	8.8	
PM	Total Catch, g	0 0116	0.0102	0 0129	0.0122	0 0117
C_{PM}	**Concentration, gr/dscf**	**4.10E-03**	**2.27E-02**	**4.62E-03**	**4.47E-03**	**8.98E-03**
C_{PM}	**Concentration, lb/dscf**	**5.85E-07**	**3.24E-06**	**6.60E-07**	**6.39E-07**	**1.28E-06**
E_{PM}	**Emission Rate, lb/hr**	**1.22E-02**	**7.20E-02**	**1.36E-02**	**1.28E-02**	**2.77E-02**
	Condensible Matter					
PM	Organic Gain, mg	13.2	1 7	6.3	10.3	
PM	Aqueous Gain, mg	24.3	2	49.1	35	
PM	Total Catch, g	0 0375	0 0037	0 0554	0.0453	0.03
C_{PM}	**Concentration, gr/dscf**	**1.32E-02**	**8.28E-03**	**1.99E-02**	**1.67E-02**	**1.50E-02**
C_{PM}	**Concentration, lb/dscf**	**1.89E-06**	**1.18E-06**	**2.85E-06**	**2.38E-06**	**2.14E-06**
E_{PM}	**Emission Rate, lb/hr**	**3.96E-02**	**2.62E-02**	**5.87E-02**	**4.75E-02**	**4.42E-02**
	Total Particulate Matter					
PM	Total Catch, g	4 91E-02	1.39E-02	6.83E-02	5 75E-02	0.05
C_{PM}	**Concentration, gr/dscf**	**1.73E-02**	**3.10E-02**	**2.46E-02**	**2.11E-02**	**2.56E-02**
C_{PM}	**Concentration, lb/dscf**	**2.48E-06**	**4.43E-06**	**3.51E-06**	**3.02E-06**	**3.65E-06**
E_{PM}	**Emission Rate, lb/hr**	**5.18E-02**	**9.82E-02**	**7.24E-02**	**6.03E-02**	**0.08**

PARTICULATE
NF2 LIGHTING UNIT AGE

Summary of Stack Gas Parameters and Test Results
Generator Testing
Scott AFB
US EPA Test Method 5 - Particulate Matter
Light Generator
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	RUN NUMBER / RUN DATE / RUN TIME	L-5-1 / 9/10/2003 / 1313-1413	L-5-2 / 9/10/2003 / 1429-1529	L-5-3 / 9/10/2003 / 1542-1642	Average
	MEASURED DATA				
P_{static}	Stack Static Pressure, inches H_2O	0 01	0.01	0 01	0 01
y	Meter Box Correction Factor	1.006	1 006	1.006	1 006
P_{bar}	Barometric Pressure, inches Hg	30 68	30 69	30 69	30 69
V_m	Sample Volume, ft^3	28.872	28 995	28 844	28.904
$Dp^{1/2}$	Average Square Root Dp, (in $H_2O)^{1/2}$	0 1039	0 1039	0 1039	0 1039
DH	Avg Meter Orifice Pressure, in H_2O	0 64	0.64	0 64	0 64
T_m	Average Meter Temperature, °F	91	94	95	93
T_s	Average Stack Temperature, °F	263	263	263	263
V_{lc}	Condensate Collected, ml	21 6	34 0	31 9	29.2
CO_2	Carbon Dioxide content, % by volume	4 1	4 1	4.3	4.2
O_2	Oxygen content, % by volume	14 9	15 1	15 3	15 1
N_2	Nitrogen content, % by volume	81.0	80.8	80 4	80 7
C_p	Pitot Tube Coefficient	0 99	0 99	0 99	0.99
	Circular Stack? 1=Y,0=N:	1	1	1	
As	Diameter or Dimensions, inches:	4.00	4 00	4 00	4 00
Q	Sample Run Duration, minutes	60	60	60	60
D_n	Nozzle Diameter, inches	0.495	0.495	0.495	0 495
	CALCULATED DATA				
A_n	Nozzle Area, ft^2	0 001336	0 001336	0 001336	0 001336
$V_{m(std)}$	Standard Meter Volume, ft^3	28.598	28 548	28.333	28.493
$V_{m(std)}$	Standard Meter Volume, m^3	0.810	0 808	0 802	0.807
Q_m	Average Sampling Rate, dscfm	0.477	0 476	0 472	0.475
P_s	Stack Pressure, inches Hg	30 68	30.69	30 69	30 69
B_{ws}	Moisture, % by volume	3.4	5.3	5 0	4.6
$B_{ws(sat)}$	Moisture (at saturation), % by volume	248 8	248 7	248.7	248 7
V_{wstd}	Standard Water Vapor Volume, ft^3	1 017	1 600	1.502	1.373
$1\text{-}B_{ws}$	Dry Mole Fraction	0.966	0 947	0 950	0.954
M_d	Molecular Weight (d b), lb/lb•mole	29.25	29.26	29.30	29.27
M_s	Molecular Weight (w b), lb/lb•mole	28 87	28 66	28 73	28 75
V_s	Stack Gas Velocity, ft/s	7 9	8 0	8 0	8.0
A	Stack Area, ft^2	0.1	0.1	0.1	0 09
Q_a	Stack Gas Volumetric flow, acfm	42	42	42	42
Q_s	Stack Gas Volumetric flow, dscfm	30	30	30	30
Q_s	Stack Gas Volumetric flow, dscmm	1	1	1	1
I	Isokinetic Sampling Ratio, %	103.5	105.0	104.0	104.2

Summary of Stack Gas Parameters and Test Results
Generator Testing
Scott AFB
US EPA Test Method 5 - Particulate Matter
Light Generator
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	RUN NUMBER	***L-5-1***	***L-5-2***	***L-5-3***	
	RUN DATE	***9/10/2003***	***9/10/2003***	***9/10/2003***	***Average***
	RUN TIME	***1313-1413***	***1429-1529***	***1542-1642***	
	EMISSIONS DATA				
	Particulate Matter				
PM	Filter Weight Gain, mg	7.55	7 75	6 65	
PM	Beaker Weight Gain, mg	5.4	4.45	4.35	
PM	Total Catch, g	0 0130	0.0122	0 0110	0.0121
C_{PM}	**Concentration, gr/dscf**	**6.99E-03**	**6.59E-03**	**5.99E-03**	**6.52E-03**
C_{PM}	**Concentration, lb/dscf**	**9.98E-07**	**9.42E-07**	**8.56E-07**	**9.32E-07**
E_{PM}	**Emission Rate, lb/hr**	**1.80E-03**	**1.67E-03**	**1.52E-03**	**1.67E-03**
	Condensible Matter				
PM	Organic Gain, mg	3 5	2 1	4	
PM	Aqueous Gain, mg	22.2	18.3	24.6	
PM	Total Catch, g	0 0257	0.0204	0 0286	0.02
C_{PM}	**Concentration, gr/dscf**	**1.39E-02**	**1.10E-02**	**1.56E-02**	**1.35E-02**
C_{PM}	**Concentration, lb/dscf**	**1.98E-06**	**1.58E-06**	**2.23E-06**	**1.93E-06**
E_{PM}	**Emission Rate, lb/hr**	**3.57E-03**	**2.80E-03**	**3.96E-03**	**3.44E-03**
	Total Particulate Matter				
PM	Total Catch, g	0 04	0 03	0 04	0.04
C_{PM}	**Concentration, gr/dscf**	**2.09E-02**	**1.76E-02**	**2.16E-02**	**2.00E-02**
C_{PM}	**Concentration, lb/dscf**	**2.98E-06**	**2.52E-06**	**3.08E-06**	**2.86E-06**
E_{PM}	**Emission Rate, lb/hr**	**5.38E-03**	**4.47E-03**	**5.48E-03**	**5.11E-03**

VOLATILE ORGANIC COMPOUNDS

Summary of Stack Gas Parameters and Test Results
030174.0006.002
Scott AFB Generator Testing
VOST - SW-846 Method 0030

	RUN NUMBER	***0030-1 (-86)***	***0030-2 (MF2)***	
	RUN DATE	***09/08/03 - 09/10/03***	***9/10/2003***	***Average***
	RUN TIME	***Composite***	***1328 - 1428***	
	MEASURED DATA			
γ	Meter Box Correction Factor	0 971	0 971	0 971
P_{bar}	Barometric Pressure, inches Hg	30 65	30 68	30 67
P_{static}	Stack Static Pressure, inches H_2O	5 22	0.01	2 62
V_m	Sample Volume, L	10 280	15.920	13 100
$\Delta p^{1/2}$	Average Square Root Δp, (in $H_2O)^{1/2}$	1 4267	0 1039	0.7653
ΔH	Avg Meter Orifice Pressure, in H_2O	1.85	0 63	1.24
T_m	Average Meter Temperature, °F	79	100	90
T_s	Average Stack Temperature, °F	548	263	406
V_{lc}	Condensate Collected, ml	46 7	34 5	40 6
CO_2	Carbon Dioxide content, % by volume	5 00	4 17	4 59
O_2	Oxygen content, % by volume	14 70	15 1	14 90
N_2	Nitrogen content, % by volume	80 30	80 73	80.52
C_p	Pitot Tube Coefficient	0 99	0.99	0 99
	Circular Stack? 1=Y,0=N:	1	1	
As	Diameter or Dimensions, inches	4 00	4 00	4 00
F	Fuel Flow, lb/hr	5 04	2 00	3 52
Θ	Sample Run Duration, minutes	50	60	55
	CALCULATED DATA			
$V_{m(std)}$	Standard Meter Volume, dscl	10 058	14 963	12 511
$V_{m(std)}$	Standard Meter Volume, dscf	0 355	0 528	0 44
P_s	Stack Pressure, inches Hg	31 03	30 68	30.86
A	Stack Area, ft^2	0 09	0.09	0 09
Q_a	Stack Gas Volumetric flow, acfm	672	42	357
Q_s	Stack Gas Volumetric flow, dscfm	344	30	187
$Q_{s(cmm)}$	Stack Gas Volumetric flow, dscmm	10	1	5

030174.0006.002

	0030-1 (-86)	0030-2 (MF2)	Average
Acetone			
Molecular Weight, g/g-mole	58.08	58 08	
Target Catch, µg	0.84	0 42	0.63
Concentration, mg/dscm [a]	8.31E-02	4 18E-02	0 06
Concentration, ppbvd [b]	3.44E+01	1 73E+01	25 86
Emission Rate, lb/hr [c]	1.07E-04	5.38E-05	0 00
Emission Rate, lb/1000 lb fuel	2 12E-02	2.69E-02	0 02
Benzene			
Molecular Weight, g/g-mole	78.11	78 11	
Target Catch, µg	1.52	3.40	2.46
Concentration, mg/dscm [a]	1.51E-01	3 38E-01	0 24
Concentration, ppbvd [b]	4.66E+01	1.04E+02	75 35
Emission Rate, lb/hr [c]	1.95E-04	4.36E-04	0.00
Emission Rate, lb/1000 lb fuel	3.87E-02	2 18E-01	0.13
Bromodichloromethane			
Molecular Weight, g/g-mole	163 83	163.83	
Target Catch, µg	*0.01*	*0 01*	*0.01*
Concentration, mg/dscm [a]	*9 94E-04*	*9 94E-04*	*0 00*
Concentration, ppbvd [b]	*1 46E-01*	*1 46E-01*	*0 15*
Emission Rate, lb/hr [c]	*1 28E-06*	*1 28E-06*	*0 00*
Emission Rate, lb/1000 lb fuel	*2 54E-04*	*6 40E-04*	*0.00*
Bromoform			
Molecular Weight, g/g-mole	252.73	252 73	
Target Catch, µg	*0 01*	*0.01*	*0.01*
Concentration, mg/dscm [a]	*9 94E-04*	*9 94E-04*	*0 00*
Concentration, ppbvd [b]	*9 46E-02*	*9 46E-02*	*0.09*
Emission Rate, lb/hr [c]	*1 28E-06*	*1 28E-06*	*0.00*
Emission Rate, lb/1000 lb fuel	*2.54E-04*	*6.40E-04*	*0.00*

[a] Milligrams per dry standard cubic meter at 68° F (20° C) and 1 atm.

[b] Parts per billion by volume.

[c] Pounds per hour

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	0030-1 (-86)	0030-2 (MF2)	Average
Bromomethane			
Molecular Weight, g/g-mole	94 94	94 94	
Target Catch, µg	0 13	0.01	0 07
Concentration, mg/dscm [a]	1.29E-02	1.09E-03	0 01
Concentration, ppbvd [b]	3.27E+00	2.77E-01	1 78
Emission Rate, lb/hr [c]	1.67E-05	1 41E-06	0.00
Emission Rate, lb/1000 lb fuel	3.30E-03	7 04E-04	0.00
2-Butanone			
Molecular Weight, g/g-mole	72 11	72 11	
Target Catch, µg	0 19	0.46	0 33
Concentration, mg/dscm [a]	1 89E-02	4.57E-02	0 03
Concentration, ppbvd [b]	6.30E+00	1 53E+01	10.78
Emission Rate, lb/hr [c]	2.43E-05	5 89E-05	0.00
Emission Rate, lb/1000 lb fuel	4 83E-03	2 95E-02	0.02
1,3 Butadiene			
Molecular Weight, g/g-mole	54.09	54 09	
Target Catch, µg	*0 05*	*0 05*	*0 05*
Concentration, mg/dscm [a]	*4 97E-03*	*4 97E-03*	*0 00*
Concentration, ppbvd [b]	*2 21E+00*	*2 21E+00*	*2 21*
Emission Rate, lb/hr [c]	*6.41E-06*	*6 41E-06*	*0.00*
Emission Rate, lb/1000 lb fuel	*1 27E-03*	*3 20E-03*	*0 00*
Carbon disulfide			
Molecular Weight, g/g-mole	76 13	76 13	
Target Catch, µg	*0.01*	*0 01*	*0.01*
Concentration, mg/dscm [a]	*9 94E-04*	*9.94E-04*	*0 00*
Concentration, ppbvd [b]	*3 14E-01*	*3 14E-01*	*0 31*
Emission Rate, lb/hr [c]	*1 28E-06*	*1.28E-06*	*0.00*
Emission Rate, lb/1000 lb fuel	*2.54E-04*	*6.40E-04*	*0.00*

[a] Milligrams per dry standard cubic meter at 68° F (20° C) and 1 atm.

[b] Parts per billion by volume.

[c] Pounds per hour

030174.0006.002

	0030-1 (-86)	0030-2 (MF2)	Average
Carbon tetrachloride			
Molecular Weight, g/g-mole	153 84	153.84	
Target Catch, µg	*0.01*	*0.01*	*0 01*
Concentration, mg/dscm [a]	*9 94E-04*	*9 94E-04*	*0 00*
Concentration, ppbvd [b]	*1 55E-01*	*1 55E-01*	*0 16*
Emission Rate, lb/hr [c]	*1.28E-06*	*1 28E-06*	*0 00*
Emission Rate, lb/1000 lb fuel	*2 54E-04*	*6.40E-04*	*0 00*
Chlorobenzene			
Molecular Weight, g/g-mole	112 56	112.56	
Target Catch, µg	*0.01*	*0.01*	*0 01*
Concentration, mg/dscm [a]	*1 39E-03*	*1 39E-03*	*0 00*
Concentration, ppbvd [b]	*2 97E-01*	*2 97E-01*	*0 30*
Emission Rate, lb/hr [c]	*1 79E-06*	*1.79E-06*	*0.00*
Emission Rate, lb/1000 lb fuel	*3 56E-04*	*8 96E-04*	*0.00*
Chlorodibromomethane			
Molecular Weight, g/g-mole	208.28	208 28	
Target Catch, µg	*0 01*	*0 01*	*0 01*
Concentration, mg/dscm [a]	*1 39E-03*	*1 39E-03*	*0 00*
Concentration, ppbvd [b]	*1.61E-01*	*1 61E-01*	*0 16*
Emission Rate, lb/hr [c]	*1 79E-06*	*1 79E-06*	*0 00*
Emission Rate, lb/1000 lb fuel	*3 56E-04*	*8.96E-04*	*0 00*
Chloroethane			
Molecular Weight, g/g-mole	65 51	65 51	
Target Catch, µg	*0 01*	*0 01*	*0 01*
Concentration, mg/dscm [a]	*1 39E-03*	*1 39E-03*	*0 00*
Concentration, ppbvd [b]	*5.11E-01*	*5.11E-01*	*0.51*
Emission Rate, lb/hr [c]	*1 79E-06*	*1 79E-06*	*0.00*
Emission Rate, lb/1000 lb fuel	*3 56E-04*	*8.96E-04*	*0 00*
Chloroform			
Molecular Weight, g/g-mole	119 39	119 39	
Target Catch, µg	*0 01*	*0 01*	*0 01*
Concentration, mg/dscm [a]	*1 39E-03*	*1.39E-03*	*0 00*
Concentration, ppbvd [b]	*2 80E-01*	*2 80E-01*	*0 28*
Emission Rate, lb/hr [c]	*1 79E-06*	*1 79E-06*	*0 00*
Emission Rate, lb/1000 lb fuel	*3.56E-04*	*8.96E-04*	*0.00*

[a] Milligrams per dry standard cubic meter at 68° F (20° C) and 1 atm.

[b] Parts per billion by volume.

[c] Pounds per hour

030174.0006.002

	0030-1 (-86)	0030-2 (MF2)	Average
Chloromethane			
Molecular Weight, g/g-mole	50 49	50.49	
Target Catch, µg	*0 01*	*0 01*	*0 01*
Concentration, mg/dscm [a]	*9 94E-04*	*9 94E-04*	*0 00*
Concentration, ppbvd [b]	*4 74E-01*	*4 74E-01*	*0 47*
Emission Rate, lb/hr [c]	*1 28E-06*	*1 28E-06*	*0.00*
Emission Rate, lb/1000 lb fuel	*2 54E-04*	*6.40E-04*	*0.00*
1,1-Dichloroethane			
Molecular Weight, g/g-mole	98 96	98.96	
Target Catch, µg	*0 01*	*0 01*	*0 01*
Concentration, mg/dscm [a]	*1.39E-03*	*1 39E-03*	*0.00*
Concentration, ppbvd [b]	*3 38E-01*	*3 38E-01*	*0.34*
Emission Rate, lb/hr [c]	*1 79E-06*	*1 79E-06*	*0 00*
Emission Rate, lb/1000 lb fuel	*3.56E-04*	*8.96E-04*	*0.00*
1,2-Dichloroethane			
Molecular Weight, g/g-mole	98.96	98 96	
Target Catch, µg	*0.01*	*0 01*	*0 01*
Concentration, mg/dscm [a]	*1 39E-03*	*1 39E-03*	*0.00*
Concentration, ppbvd [b]	*3.38E-01*	*3.38E-01*	*0 34*
Emission Rate, lb/hr [c]	*1 79E-06*	*1.79E-06*	*0 00*
Emission Rate, lb/1000 lb fuel	*3 56E-04*	*8 96E-04*	*0.00*
1,1-Dichloroethene			
Molecular Weight, g/g-mole	96 94	96.94	
Target Catch, µg	*0 01*	*0.01*	*0 01*
Concentration, mg/dscm [a]	*1.39E-03*	*1.39E-03*	*0 00*
Concentration, ppbvd [b]	*3 45E-01*	*3 45E-01*	*0.35*
Emission Rate, lb/hr [c]	*1 79E-06*	*1 79E-06*	*0.00*
Emission Rate, lb/1000 lb fuel	*3.56E-04*	*8.96E-04*	*0.00*

[a] Milligrams per dry standard cubic meter at 68° F (20° C) and 1 atm.

[b] Parts per billion by volume.

[c] Pounds per hour

030174.0006.002

	0030-1 (-86)	0030-2 (MF2)	Average
cis-1,2-Dichloroethene			
Molecular Weight, g/g-mole	96.94	96.94	
Target Catch, µg	*0 01*	*0.01*	*0 01*
Concentration, mg/dscm [a]	*1.39E-03*	*1 39E-03*	*0 00*
Concentration, ppbvd [b]	*3 45E-01*	*3 45E-01*	*0.35*
Emission Rate, lb/hr [c]	*1 79E-06*	*1 79E-06*	*0 00*
Emission Rate, lb/1000 lb fuel	*3.56E-04*	*8 96E-04*	*0 00*
trans-1,2-Dichloroethene			
Molecular Weight, g/g-mole	96.94	96.94	
Target Catch, µg	*0 01*	*0.01*	*0 01*
Concentration, mg/dscm [a]	*1 39E-03*	*1 39E-03*	*0 00*
Concentration, ppbvd [b]	*3 45E-01*	*3 45E-01*	*0 35*
Emission Rate, lb/hr [c]	*1 79E-06*	*1 79E-06*	*0 00*
Emission Rate, lb/1000 lb fuel	*3 56E-04*	*8 96E-04*	*0 00*
1,2-Dichloropropane			
Molecular Weight, g/g-mole	112 99	112 99	
Target Catch, µg	*0.01*	*0 01*	*0 01*
Concentration, mg/dscm [a]	*1 39E-03*	*1.39E-03*	*0 00*
Concentration, ppbvd [b]	*2 96E-01*	*2 96E-01*	*0 30*
Emission Rate, lb/hr [c]	*1 79E-06*	*1 79E-06*	*0.00*
Emission Rate, lb/1000 lb fuel	*3.56E-04*	*8.96E-04*	*0.00*

[a] Milligrams per dry standard cubic meter at 68° F (20° C) and 1 atm.

[b] Parts per billion by volume.

[c] Pounds per hour.

030174.0006.002

	0030-1 (-86)	0030-2 (MF2)	Average
cis-1,3-Dichloropropene			
Molecular Weight, g/g-mole	110.97	110 97	
Target Catch, µg	*0 01*	*0.01*	*0.01*
Concentration, mg/dscm [a]	*1 39E-03*	*1 39E-03*	*0 00*
Concentration, ppbvd [b]	*3 02E-01*	*3 02E-01*	*0 30*
Emission Rate, lb/hr [c]	*1 79E-06*	*1 79E-06*	*0.00*
Emission Rate, lb/1000 lb fuel	*3 56E-04*	*8.96E-04*	*0.00*
trans-1,3-Dichloropropene			
Molecular Weight, g/g-mole	110.97	110 97	
Target Catch, µg	*0 01*	*0 01*	*0 01*
Concentration, mg/dscm [a]	*1 39E-03*	*1.39E-03*	*0.00*
Concentration, ppbvd [b]	*3 02E-01*	*3 02E-01*	*0 30*
Emission Rate, lb/hr [c]	*1 79E-06*	*1.79E-06*	*0.00*
Emission Rate, lb/1000 lb fuel	*3 56E-04*	*8 96E-04*	*0 00*
Ethylbenzene			
Molecular Weight, g/g-mole	106 17	106.17	
Target Catch, µg	0 44	0 52	0 48
Concentration, mg/dscm [a]	4 37E-02	5.17E-02	0.05
Concentration, ppbvd [b]	9.91E+00	1 17E+01	10.81
Emission Rate, lb/hr [c]	5.64E-05	6 66E-05	0.00
Emission Rate, lb/1000 lb fuel	1 12E-02	3.33E-02	0 02
2-Hexanone			
Molecular Weight, g/g-mole	100.16	100 16	
Target Catch, µg	*0 05*	*0 05*	*0 05*
Concentration, mg/dscm [a]	*4 97E-03*	*4 97E-03*	*0 00*
Concentration, ppbvd [b]	*1 19E+00*	*1 19E+00*	*1 19*
Emission Rate, lb/hr [c]	*6 41E-06*	*6.41E-06*	*0 00*
Emission Rate, lb/1000 lb fuel	*1.27E-03*	*3.20E-03*	*0.00*

[a] Milligrams per dry standard cubic meter at 68° F (20° C) and 1 atm.

[b] Parts per billion by volume.

[c] Pounds per hour

030174.0006.002

	0030-1 (-86)	0030-2 (MF2)	Average
Methylene chloride			
Molecular Weight, g/g-mole	84 93	84.93	
Target Catch, µg	0 40	0 55	0 48
Concentration, mg/dscm [a]	4 02E-02	5 47E-02	0 05
Concentration, ppbvd [b]	1.14E+01	1.55E+01	13 43
Emission Rate, lb/hr [c]	5.18E-05	7.05E-05	0 00
Emission Rate, lb/1000 lb fuel	1.03E-02	3.52E-02	0.02
4-Methyl-2-pentanone			
Molecular Weight, g/g-mole	100 16	100 16	
Target Catch, µg	*0 05*	*0 05*	*0 05*
Concentration, mg/dscm [a]	*4 97E-03*	*4 97E-03*	*0.00*
Concentration, ppbvd [b]	*1 19E+00*	*1 19E+00*	*1 19*
Emission Rate, lb/hr [c]	*6 41E-06*	*6 41E-06*	*0 00*
Emission Rate, lb/1000 lb fuel	*1 27E-03*	*3.20E-03*	*0.00*
Styrene			
Molecular Weight, g/g-mole	104 15	104 15	
Target Catch, µg	*0 01*	*0 01*	*0 01*
Concentration, mg/dscm [a]	*9 94E-04*	*9 94E-04*	*0.00*
Concentration, ppbvd [b]	*2 30E-01*	*2 30E-01*	*0.23*
Emission Rate, lb/hr [c]	*1 28E-06*	*1 28E-06*	*0 00*
Emission Rate, lb/1000 lb fuel	*2.54E-04*	*6.40E-04*	*0.00*

[a] Milligrams per dry standard cubic meter at 68° F (20° C) and 1 atm.

[b] Parts per billion by volume.

[c] Pounds per hour.

030174.0006.002

	0030-1 (-86)	0030-2 (MF2)	Average
1,1,2,2-Tetrachloroethane			
Molecular Weight, g/g-mole	167 85	167.85	
Target Catch, µg	*0 01*	*0 01*	*0 01*
Concentration, mg/dscm [a]	*1 39E-03*	*1 39E-03*	*0 00*
Concentration, ppbvd [b]	*1 99E-01*	*1.99E-01*	*0.20*
Emission Rate, lb/hr [c]	*1 79E-06*	*1 79E-06*	*0.00*
Emission Rate, lb/1000 lb fuel	*3 56E-04*	*8 96E-04*	*0 00*
Tetrachloroethene			
Molecular Weight, g/g-mole	165 83	165.83	
Target Catch, µg	*0 01*	*0.01*	*0 01*
Concentration, mg/dscm [a]	*1 39E-03*	*1 39E-03*	*0.00*
Concentration, ppbvd [b]	*2.02E-01*	*2 02E-01*	*0.20*
Emission Rate, lb/hr [c]	*1 79E-06*	*1 79E-06*	*0 00*
Emission Rate, lb/1000 lb fuel	*3 56E-04*	*8.96E-04*	*0 00*
Toluene			
Molecular Weight, g/g-mole	94.14	94 14	
Target Catch, µg	0 74	1 40	1.07
Concentration, mg/dscm [a]	7 36E-02	1.39E-01	0 11
Concentration, ppbvd [b]	1 88E+01	3.56E+01	27 18
Emission Rate, lb/hr [c]	9.48E-05	1.79E-04	0 00
Emission Rate, lb/1000 lb fuel	1.88E-02	8.96E-02	0.05

[a] Milligrams per dry standard cubic meter at 68° F (20° C) and 1 atm.

[b] Parts per billion by volume.

[c] Pounds per hour

030174.0006.002

	0030-1 (-86)	0030-2 (MF2)	Average
1,1,1-Trichloroethane			
Molecular Weight, g/g-mole	133.40	133 40	
Target Catch, µg	*0 01*	*0 01*	*0 01*
Concentration, mg/dscm [a]	*1 39E-03*	*1 39E-03*	*0.00*
Concentration, ppbvd [b]	*2 51E-01*	*2 51E-01*	*0 25*
Emission Rate, lb/hr [c]	*1 79E-06*	*1 79E-06*	*0.00*
Emission Rate, lb/1000 lb fuel	*3 56E-04*	*8.96E-04*	*0.00*
1,1,2-Trichloroethane			
Molecular Weight, g/g-mole	133.40	133.40	
Target Catch, µg	*0.01*	*0 01*	*0 01*
Concentration, mg/dscm [a]	*1 39E-03*	*1 39E-03*	*0 00*
Concentration, ppbvd [b]	*2 51E-01*	*2 51E-01*	*0 25*
Emission Rate, lb/hr [c]	*1 79E-06*	*1 79E-06*	*0 00*
Emission Rate, lb/1000 lb fuel	*3 56E-04*	*8.96E-04*	*0 00*
Trichloroethene			
Molecular Weight, g/g-mole	131 39	131 39	
Target Catch, µg	*0 01*	*0 01*	*0 01*
Concentration, mg/dscm [a]	*1 39E-03*	*1 39E-03*	*0 00*
Concentration, ppbvd [b]	*2 55E-01*	*2 55E-01*	*0.25*
Emission Rate, lb/hr [c]	*1.79E-06*	*1 79E-06*	*0 00*
Emission Rate, lb/1000 lb fuel	*3 56E-04*	*8 96E-04*	*0 00*
Trichlorofluoromethane (Freon 11)			
Molecular Weight, g/g-mole	137.37	137.37	
Target Catch, µg	*0 01*	*0 01*	*0 01*
Concentration, mg/dscm [a]	*9 94E-04*	*9 94E-04*	*0.00*
Concentration, ppbvd [b]	*1 74E-01*	*1 74E-01*	*0 17*
Emission Rate, lb/hr [c]	*1.28E-06*	*1 28E-06*	*0.00*
Emission Rate, lb/1000 lb fuel	*2.54E-04*	*6.40E-04*	*0.00*

[a] Milligrams per dry standard cubic meter at 68° F (20° C) and 1 atm.

[b] Parts per billion by volume.

[c] Pounds per hour

030174.0006.002

	0030-1 (-86)	0030-2 (MF2)	Average
o-Xylene			
Molecular Weight, g/g-mole	106 17	106 17	
Target Catch, µg	0 35	0 57	0.46
Concentration, mg/dscm [a]	1.07E-03	1.07E-03	0.00
Concentration, ppbvd [b]	7.88E+00	1.28E+01	10.36
Emission Rate, lb/hr [c]	4.48E-05	7.30E-05	0.00
Emission Rate, lb/1000 lb fuel	8 90E-03	3 65E-02	0 02
m-Xylene & p-Xylene			
Molecular Weight, g/g-mole	106 17	106 17	
Target Catch, µg	0 84	1.20	1.02
Concentration, mg/dscm [a]	8.33E-02	1.19E-01	0.10
Concentration, ppbvd [b]	1 89E+01	2 70E+01	22.95
Emission Rate, lb/hr [c]	1 07E-04	1 54E-04	0 00
Emission Rate, lb/1000 lb fuel	2 13E-02	7 68E-02	0 05
Vinyl acetate			
Molecular Weight, g/g-mole	86.09	86.09	
Target Catch, µg	*0 05*	*0.05*	*0.05*
Concentration, mg/dscm [a]	*4 97E-03*	*4 97E-03*	*0 00*
Concentration, ppbvd [b]	*1 39E+00*	*1 39E+00*	*1 39*
Emission Rate, lb/hr [c]	*6.41E-06*	*6.41E-06*	*0 00*
Emission Rate, lb/1000 lb fuel	*1.27E-03*	*3.20E-03*	*0.00*

[a] Milligrams per dry standard cubic meter at 68° F (20° C) and 1 atm.

[b] Parts per billion by volume.

[c] Pounds per hour.

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POLYNUCLEAR AROMATIC HYDROCARBONS

Summary of Stack Gas Parameters and Test Results
030174.0006.002
Scott AFB Generator Testing
PAH Method 5515

	RUN NUMBER	***PAH-1 (-86)***	***PAH-2 (MF2)***	
	RUN DATE	***09/08/03 - 09/10/03***	***9/10/2003***	***Average***
	RUN TIME	***Composite***	***1325 - 1425***	
	MEASURED DATA			
P_{static}	Stack Static Pressure, inches H_2O	5.22	0.01	2.62
y	Meter Box Correction Factor	1.273	1.273	1.273
P_{bar}	Barometric Pressure, inches Hg	30.65	30.68	30 67
V_m	Sample Volume, L^3	11.780	16.150	13.965
$Dp^{1/2}$	Average Square Root Dp, (in. $H_2O)^{1/2}$	1.4267	0.1039	0.7653
T_m	Average Meter Temperature, °F	78	101	90
T_s	Average Stack Temperature, °F	548	263	406
CO_2	Carbon Dioxide content, % by volume	5.0	4.2	4 6
O_2	Oxygen content, % by volume	14.7	15.1	14 9
N_2	Nitrogen content, % by volume	80.3	80 7	80 5
C_p	Pitot Tube Coefficient	0.99	0.99	0.99
	Circular Stack? 1=Y,0=N	1	1	
As	Diameter or Dimensions, inches	4.00	4.00	4.00
F	Fuel Flow, lb/hr	5.04	2.00	
Q	Sample Run Duration, minutes	50	60	55
	CALCULATED DATA			
$V_{m(std)}$	Standard Meter Volume,L^3	15.072	19.858	17.465
$V_{m(std)}$	Standard Meter Volume,ft^3	0.532	0.701	0.617
P_s	Stack Pressure, inches Hg	31.03	30.68	30.86
B_{ws}	Moisture, % by volume	5.1	5.4	5.2
$1\text{-}B_{ws}$	Dry Mole Fraction	0.949	0.946	0.948
M_d	Molecular Weight (d.b.), lb/lb•mole	29.39	29.27	29.33
M_s	Molecular Weight (w b), lb/lb•mole	28.81	28.66	28.74
V_s	Stack Gas Velocity, ft/s	128.2	8.0	68.1
A	Stack Area, ft^2	0.1	0.1	0.09
Q_a	Stack Gas Volumetric flow, acfm	672	42	357
Q_s	Stack Gas Volumetric flow, dscfm	344	30	187
Q_s	Stack Gas Volumetric flow, dscmm	10	1	5

Summary of Stack Gas Parameters and Test Results
030174.0006.002
Scott AFB Generator Testing
PAH Method 5515

	RUN NUMBER RUN DATE RUN TIME	PAH-1 (-86) 09/08/03 - 09/10/03 Composite	PAH-2 (MF2) 9/10/2003 1325 - 1425	Average
	EMISSIONS DATA			
	Naphthalene			
	Analysis, ug/sample	2.0	2.0	2.0
	Molecular Weight, MW	128.2	128.2	128.2
	Concentration, lb/dscf	8.27E-09	6.28E-09	0.0
ppmdv	Parts Per Million, Wet Basis	2.48E-02	1.89E-02	2.19E-02
	Parts Per Million, Dry Basis	2.62E-02	1.99E-02	2.31E-02
	Emission Rate, lb/hr	1.80E-04	1.19E-05	9.59E-05
	Emission Rate, lb/1000 lb fuel	3.56E-02	5.97E-03	2.08E-02
	2-Methylnaphthalene			
	Analysis, ug/sample	2.0	2.0	2.0
	Molecular Weight, MW	142.2	142.2	142.2
	Concentration, lb/dscf	8.27E-09	6.28E-09	0.0
ppmdv	Parts Per Million, Dry Basis	2.24E-02	1.70E-02	1.97E-02
	Parts Per Million, Dry Basis	2.36E-02	1.80E-02	2.08E-02
	Emission Rate, lb/hr	1.80E-04	1.19E-05	9.59E-05
	Emission Rate, lb/1000 lb fuel	3.56E-02	5.97E-03	2.08E-02
	2-Chloronaphthalene			
	Analysis, ug/sample	2 0	2.0	2.0
	Molecular Weight, MW	162.6	162.6	162.6
	Concentration, lb/dscf	8.27E-09	6.28E-09	0.0
ppmdv	Parts Per Million, Wet Basis	1.96E-02	1.49E-02	1.72E-02
	Parts Per Million, Dry Basis	2.06E-02	1.57E-02	1.82E-02
	Emission Rate, lb/hr	1.80E-04	1.19E-05	9.59E-05
	Emission Rate, lb/1000 lb fuel	3.56E-02	5.97E-03	2.08E-02
	Acenaphthene			
	Analysis, ug/sample	2.0	2.0	2.0
	Molecular Weight, MW	154.2	154.2	154.2
	Concentration, lb/dscf	8.27E-09	6.28E-09	0.0
ppmdv	Parts Per Million, Dry Basis	2.07E-02	1.57E-02	1.82E-02
	Parts Per Million, Dry Basis	2.18E-02	1.66E-02	1.92E-02
	Emission Rate, lb/hr	1.80E-04	1.19E-05	9.59E-05
	Emission Rate, lb/1000 lb fuel	3.56E-02	5.97E-03	2.08E-02
	Acenaphthylene			
	Analysis, ug/sample	2.0	2.0	2.0
	Molecular Weight, MW	152.2	152.2	152.2
	Concentration, lb/dscf	8.27E-09	6.28E-09	0.0
ppmdv	Parts Per Million, Wet Basis	2.09E-02	1.59E-02	1.84E-02
	Parts Per Million, Dry Basis	2.20E-02	1.68E-02	1.94E-02
	Emission Rate, lb/hr	1.80E-04	1.19E-05	9.59E-05
	Emission Rate, lb/1000 lb fuel	3.56E-02	5.97E-03	2.08E-02

Summary of Stack Gas Parameters and Test Results
030174.0006.002
Scott AFB Generator Testing
PAH Method 5515

	RUN NUMBER	***PAH-1 (-86)***	***PAH-2 (MF2)***	
	RUN DATE	***09/08/03 - 09/10/03***	***9/10/2003***	***Average***
	RUN TIME	***Composite***	***1325 - 1425***	
	Fluorene			
	Analysis, *u*g/sample	*2 0*	*2.0*	***2.0***
	Molecular Weight, MW	*166.2*	*166.2*	***166.2***
	Concentration, lb/dscf	***8.27E-09***	***6.28E-09***	***0.0***
ppmdv	**Parts Per Million, Dry Basis**	***1.92E-02***	***1.45E-02***	***1.69E-02***
	Parts Per Million, Dry Basis	***2.02E-02***	***1.54E-02***	***1.78E-02***
	Emission Rate, lb/hr	***1.80E-04***	***1.19E-05***	***9.59E-05***
	Emission Rate, lb/1000 lb fuel	*3.56E-02*	*5.97E-03*	***2.08E-02***
	Phenanthrene			
	Analysis, *u*g/sample	*2.0*	*2.0*	***2.0***
	Molecular Weight, MW	*178.0*	*178.0*	***178.0***
	Concentration, lb/dscf	***8.27E-09***	***6.28E-09***	***0.0***
ppmdv	**Parts Per Million, Dry Basis**	***1.79E-02***	***1.36E-02***	***1.57E-02***
	Parts Per Million, Dry Basis	***1.89E-02***	***1.44E-02***	***1.66E-02***
	Emission Rate, lb/hr	***1.80E-04***	***1.19E-05***	***9.59E-05***
	Emission Rate, lb/1000 lb fuel	*3.56E-02*	*5.97E-03*	***2.08E-02***
	Anthracene			
	Analysis, *u*g/sample	*2.0*	*2.0*	***2.0***
	Molecular Weight, MW	*178.2*	*178.2*	***178.2***
	Concentration, lb/dscf	***8.27E-09***	***6.28E-09***	***0.0***
ppmdv	**Parts Per Million, Dry Basis**	***1.79E-02***	***1.36E-02***	***1.57E-02***
	Parts Per Million, Dry Basis	***1.88E-02***	***1.43E-02***	***1.66E-02***
	Emission Rate, lb/hr	***1.80E-04***	***1.19E-05***	***9.59E-05***
	Emission Rate, lb/1000 lb fuel	*3.56E-02*	*5.97E-03*	***2.08E-02***
	Fluoranthene			
	Analysis, *u*g/sample	*2.0*	*2.0*	***2.0***
	Molecular Weight, MW	*202.3*	*202.3*	***202.3***
	Concentration, lb/dscf	***8.27E-09***	***6.28E-09***	***0.0***
ppmdv	**Parts Per Million, Dry Basis**	***1.57E-02***	***1.20E-02***	***1.38E-02***
	Parts Per Million, Dry Basis	***1.66E-02***	***1.26E-02***	***1.46E-02***
	Emission Rate, lb/hr	***1.80E-04***	***1.19E-05***	***9.59E-05***
	Emission Rate, lb/1000 lb fuel	*3 56E-02*	*5 97E-03*	***2.08E-02***
	Pyrene			
	Analysis, *u*g/sample	*2.0*	*2.0*	***2.0***
	Molecular Weight, MW	*202.3*	*202.3*	***202.3***
	Concentration, lb/dscf	***8.27E-09***	***6.28E-09***	***0.0***
ppmdv	**Parts Per Million, Dry Basis**	***1.57E-02***	***1.20E-02***	***1.38E-02***
	Parts Per Million, Dry Basis	***1.66E-02***	***1.26E-02***	***1.46E-02***
	Emission Rate, lb/hr	***1.80E-04***	***1.19E-05***	***9.59E-05***
	Emission Rate, lb/1000 lb fuel	*3.56E-02*	*5.97E-03*	***2.08E-02***

Summary of Stack Gas Parameters and Test Results
030174.0006.002
Scott AFB Generator Testing
PAH Method 5515

	RUN NUMBER RUN DATE RUN TIME	PAH-1 (-86) 09/08/03 - 09/10/03 Composite	PAH-2 (MF2) 9/10/2003 1325 - 1425	Average
	Chrysene			
	Analysis, u g/sample	2 0	2 0	2.0
	Molecular Weight, MW	228.3	228.3	228.3
	Concentration, lb/dscf	8.27E-09	6.28E-09	0.0
ppmdv	**Parts Per Million, Dry Basis**	1.40E-02	1.06E-02	1.23E-02
	Parts Per Million, Dry Basis	1.47E-02	1.12E-02	1.29E-02
	Emission Rate, lb/hr	1.80E-04	1.19E-05	9.59E-05
	Emission Rate, lb/1000 lb fuel	3.56E-02	5.97E-03	2.08E-02
	Benzo(a)anthracene			
	Analysis, u g/sample	2.0	2.0	2.0
	Molecular Weight, MW	228.3	228.3	228.3
	Concentration, lb/dscf	8.27E-09	6.28E-09	0.0
ppmdv	**Parts Per Million, Dry Basis**	1.40E-02	1.06E-02	1.23E-02
	Parts Per Million, Dry Basis	1.47E-02	1.12E-02	1.29E-02
	Emission Rate, lb/hr	1.80E-04	1.19E-05	9.59E-05
	Emission Rate, lb/1000 lb fuel	3.56E-02	5.97E-03	2.08E-02
	Benzo(b)fluoranthene			
	Analysis, u g/sample	2.0	2 0	2.0
	Molecular Weight, MW	252.3	252.3	252.3
	Concentration, lb/dscf	8.27E-09	6.28E-09	0.0
ppmdv	**Parts Per Million, Dry Basis**	1.26E-02	9.58E-03	1.11E-02
	Parts Per Million, Dry Basis	1.33E-02	1.01E-02	1.17E-02
	Emission Rate, lb/hr	1.80E-04	1.19E-05	9.59E-05
	Emission Rate, lb/1000 lb fuel	3.56E-02	5.97E-03	2.08E-02
	Benzo(k)fluoranthene			
	Analysis, u g/sample	2.0	2.0	2.0
	Molecular Weight, MW	252.3	252.3	252.3
	Concentration, lb/dscf	8.27E-09	6.28E-09	0.0
ppmdv	**Parts Per Million, Dry Basis**	1.26E-02	9.58E-03	1.11E-02
	Parts Per Million, Dry Basis	1.33E-02	1.01E-02	1.17E-02
	Emission Rate, lb/hr	1.80E-04	1.19E-05	9.59E-05
	Emission Rate, lb/1000 lb fuel	3.56E-02	5.97E-03	2.08E-02
	Benzo(a)pyrene			
	Analysis, u g/sample	2.0	2.0	2.0
	Molecular Weight, MW	252.3	252.3	252.3
	Concentration, lb/dscf	8.27E-09	6.28E-09	0.0
ppmdv	**Parts Per Million, Dry Basis**	1.26E-02	9.58E-03	1.11E-02
	Parts Per Million, Dry Basis	1.33E-02	1.01E-02	1.17E-02
	Emission Rate, lb/hr	1.80E-04	1.19E-05	9.59E-05
	Emission Rate, lb/1000 lb fuel	3.56E-02	5.97E-03	2.08E-02

Summary of Stack Gas Parameters and Test Results
030174.0006.002
Scott AFB Generator Testing
PAH Method 5515

	RUN NUMBER RUN DATE RUN TIME	PAH-1 (-86) 09/08/03 - 09/10/03 Composite	PAH-2 (MF2) 9/10/2003 1325 - 1425	Average
	Indeno(1,2,3-c,d)pyrene			
	Analysis, *u* g/sample	*2.0*	*2.0*	***2.0***
	Molecular Weight, MW	*276.3*	*276.3*	***276.3***
	Concentration, lb/dscf	***8.27E-09***	***6.28E-09***	***0.0***
ppmdv	**Parts Per Million, Dry Basis**	***1.15E-02***	***8.75E-03***	***1.01E-02***
	Parts Per Million, Dry Basis	***1.21E-02***	***9.25E-03***	***1.07E-02***
	Emission Rate, lb/hr	***1.80E-04***	***1.19E-05***	***9.59E-05***
	Emission Rate, lb/1000 lb fuel	*3.56E-02*	*5.97E-03*	***2.08E-02***
	Dibenz(a,h)anthracene			
	Analysis, *u* g/sample	*2.0*	*2.0*	***2.0***
	Molecular Weight, MW	*278.4*	*278.4*	***278.4***
	Concentration, lb/dscf	***8.27E-09***	***6.28E-09***	***0.0***
ppmdv	**Parts Per Million, Dry Basis**	***1.14E-02***	***8.68E-03***	***1.01E-02***
	Parts Per Million, Dry Basis	***1.21E-02***	***9.18E-03***	***1.06E-02***
	Emission Rate, lb/hr	***1.80E-04***	***1.19E-05***	***9.59E-05***
	Emission Rate, lb/1000 lb fuel	*3.56E-02*	*5.97E-03*	***2.08E-02***
	Benzo(g,h,i,perylene)			
	Analysis, *u* g/sample	*2.0*	*2.0*	***2.0***
	Molecular Weight, MW	*276.3*	*276.3*	***276.3***
	Concentration, lb/dscf	***8.27E-09***	***6.28E-09***	***0.0***
ppmdv	**Parts Per Million, Dry Basis**	***1.15E-02***	***8.75E-03***	***1.01E-02***
	Parts Per Million, Dry Basis	***1.21E-02***	***9.25E-03***	***1.07E-02***
	Emission Rate, lb/hr	***1.80E-04***	***1.19E-05***	***9.59E-05***
	Emission Rate, lb/1000 lb fuel	*3.56E-02*	*5.97E-03*	***2.08E-02***

Run 5515-1 and 5515-2 had a Rpt. Limit of 2.0; if ND result is shown in italics.

ALDEHYDE/KETONES

Summary of Stack Gas Parameters and Test Results
030174.006.0002
Scott AFB Generator Testing
Aldehyde/Ketones - Test Method 0011

	RUN NUMBER	***0011-1 (-86)***	***0011-2 (MF2)***	
	RUN DATE	***09/08/03 - 09/10/03***	***9/10/2003***	***Average***
	RUN TIME	***Composite***	***1325 - 1425***	
	MEASURED DATA			
P_{static}	Stack Static Pressure, inches H_2O	5.22	0.01	2 62
y	Meter Box Correction Factor	1.003	1 003	1 003
P_{bar}	Barometric Pressure, inches Hg	30 65	30 68	30 67
V_m	Sample Volume, ft^3	34 396	29 420	31 908
$Dp^{1/2}$	Average Square Root Dp, (in $H_2O)^{1/2}$	1 4267	0.1039	0 7653
DH	Avg Meter Orifice Pressure, in. H_2O	1 85	0.63	1.24
T_m	Average Meter Temperature, °F	77	99	88
T_s	Average Stack Temperature, °F	548	263	406
V_{lc}	Condensate Collected, ml	46 7	34 5	40.6
CO_2	Carbon Dioxide content, % by volume	5 0	4 2	4 6
O_2	Oxygen content, % by volume	14 7	15 1	14 9
N_2	Nitrogen content, % by volume	80.3	80 7	80 5
C_p	Pitot Tube Coefficient	0 99	0 99	0 99
	Circular Stack? 1=Y,0=N	1	1	
As	Diameter or Dimensions, inches	4.00	4.00	4 00
F	Fuel Flow, lb/hr	5.04	2.00	
Q	Sample Run Duration, minutes	50	60	55
D_n	Nozzle Diameter, inches	0 193	0 500	0 347
	CALCULATED DATA			
A_n	Nozzle Area, ft^2	0 000203	0 001363	0 000783
$V_{m(std)}$	Standard Meter Volume, ft^3	34.909	28 627	31 768
$V_{m(std)}$	Standard Meter Volume, m^3	0 989	0 811	0.900
Q_m	Average Sampling Rate, dscfm	0 698	0.477	0 588
P_s	Stack Pressure, inches Hg	31 03	30 68	30 86
B_{ws}	Moisture, % by volume	5 9	5 4	5.6
$B_{ws(sat)}$	Moisture (at saturation), % by volume	7086 4	248 8	3667 6
V_{wstd}	Standard Water Vapor Volume, ft^3	2.198	1 624	1 911
$1-B_{ws}$	Dry Mole Fraction	0 941	0 946	0 944
M_d	Molecular Weight (d b), lb/lb•mole	29 39	29.27	29 33
M_s	Molecular Weight (w.b), lb/lb•mole	28 71	28 67	28 69
V_s	Stack Gas Velocity, ft/s	128 4	8 0	68.2
A	Stack Area, ft^2	0.1	0.1	0.09
Q_a	Stack Gas Volumetric flow, acfm	672	42	357
Q_s	Stack Gas Volumetric flow, dscfm	344	30	187
Q_s	Stack Gas Volumetric flow, dscmm	10	1	5
I	Isokinetic Sampling Ratio, %	87.3	103.3	95.3

Summary of Stack Gas Parameters and Test Results
030174.006.0002
Scott AFB Generator Testing
Aldehyde/Ketones - Test Method 0011

	RUN NUMBER	***0011-1 (-86)***	***0011-2 (MF2)***	
	RUN DATE	***09/08/03 - 09/10/03***	***09/10/03***	***Average***
	RUN TIME	***Composite***	***1325 - 1425***	
	EMISSIONS DATA			
HCHO	Formaldehyde			
	Target Catch, µg	800	3800	2300.0
	Concentration, µg/dscm	809.31	4687.75	2748 53
	Emission Rate, lb/hr	1 04E-03	5 18E-04	7.79E-04
	Emission Rate, lb/1000 lb fuel	2 06E-01	2 59E-01	2 33E-01
CH_3CHO	Acetaldehyde			
	Target Catch, µg	750	1200	975.0
	Concentration, µg/dscm	758.72	1480.34	1119 53
	Emission Rate, lb/hr	9.74E-04	1 64E-04	5 69E-04
	Emission Rate, lb/1000 lb fuel	1 93E-01	8 18E-02	1.37E-01
CH_2CHCHO	Acrolein			
	Target Catch, µg	*26*	560	293 00
	Concentration, µg/dscm	*26.30*	690.83	358 56
	Emission Rate, lb/hr	*3.38E-05*	7 64E-05	5 51E-05
	Emission Rate, lb/1000 lb fuel	*6.70E-03*	3.82E-02	2.24E-02
$CH_3CH_2CH_2OH$	Propanal			
	Target Catch, µg	*26*	240	133 0
	Concentration, µg/dscm	*26 3*	296.1	161.2
	Emission Rate, lb/hr	*3.38E-05*	3 27E-05	3 33E-05
	Emission Rate, lb/1000 lb fuel	*6 70E-03*	1 64E-02	1 15E-02
$CH_3CHCHCHO$	Crotonaldehyde			
	Target Catch, µg	90	260	175 00
	Concentration, µg/dscm	91.05	320.74	205.89
	Emission Rate, lb/hr	1 17E-04	3 55E-05	7 62E-05
	Emission Rate, lb/1000 lb fuel	2 32E-02	1 77E-02	2 05E-02
$CH_3COC_5H_{11}$	Methyl Ethyl Ketone/Butyraldehydes			
	Target Catch, µg	*26*	260	143 0
	Concentration, µg/dscm	*26 3*	320.7	173.5
	Emission Rate, lb/hr	*3.38E-05*	3 55E-05	3 46E-05
	Emission Rate, lb/1000 lb fuel	*6 70E-03*	1.77E-02	1.22E-02
C_6H_5CHO	Benzaldehyde			
	Target Catch, µg	*26*	220	123 0
	Concentration, µg/dscm	*26.3*	271.4	148.8
	Emission Rate, lb/hr	*3 38E-05*	3 00E-05	3.19E-05
	Emission Rate, lb/1000 lb fuel	*6.70E-03*	1 50E-02	1 08E-02
$CH_3)_2CHCH_2CHC$	Isopentanal			
	Target Catch, µg	*26*	*110*	*68.0*
	Concentration, µg/dscm	*26 3*	*135.7*	*81.0*
	Emission Rate, lb/hr	*3 38E-05*	*1 50E-05*	*2 44E-05*
	Emission Rate, lb/1000 lb fuel	*6 70E-03*	*7 50E-03*	*7 10E-03*

Summary of Stack Gas Parameters and Test Results
030174.006.0002
Scott AFB Generator Testing
Aldehyde/Ketones - Test Method 0011

	RUN NUMBER / ***RUN DATE*** / ***RUN TIME***	***0011-1 (-86)*** / ***09/08/03 - 09/10/03*** / ***Composite***	***0011-2 (MF2)*** / ***09/10/03*** / ***1325 - 1425***	***Average***
	EMISSIONS DATA - Continued			
$CH_3(CH_2)_3CHO$	Pentanal			
	Target Catch, µg	*26*	*110*	*68.0*
	Concentration, µg/dscm	*26.3*	*135.7*	*81 0*
	Emission Rate, lb/hr	*3.38E-05*	*1.50E-05*	*2.44E-05*
	Emission Rate, lb/1000 lb fuel	*6.70E-03*	*7.50E-03*	*7 10E-03*
$C_6H_4CH_3CHO$	o-Tolualdehyde			
	Target Catch, µg	*26*	*110*	*68 0*
	Concentration, µg/dscm	*26.3*	*135.7*	*81 0*
	Emission Rate, lb/hr	*3.38E-05*	*1 50E-05*	*2 44E-05*
	Emission Rate, lb/1000 lb fuel	*6 70E-03*	*7 50E-03*	*7 10E-03*
	m,p-Tolualdehyde			
	Target Catch, µg	*26*	*110*	*68.000*
	Concentration, µg/dscm	*26 3*	*135.7*	*81.000*
	Emission Rate, lb/hr	*3.38E-05*	*1.50E-05*	*2.44E-05*
	Emission Rate, lb/1000 lb fuel	*6.70E-03*	*7 50E-03*	*7 10E-03*
$CH_3(CH_2)_4CHO$	Hexanal			
	Target Catch, µg	*26*	*110*	*68*
	Concentration, µg/dscm	*26 3*	*135.7*	*81 0*
	Emission Rate, lb/hr	*3.38E-05*	*1.50E-05*	*2.44E-05*
	Emission Rate, lb/1000 lb fuel	*6.70E-03*	*7.50E-03*	*7.10E-03*

Run 0011-1 had a Rpt. Limit of 26.0; if ND result is shown in italics. Formaldehyde was present in trip blank; Crotonaldehyde may be biased due to matrix interfe
Run 0011-2 had a Rpt. Limit of 110; If ND result is shown in italics. Formaldehyde was present in trip blank; Benzaldehyde may be biased due to matrix interfere

APPENDIX B

FIELD DATA

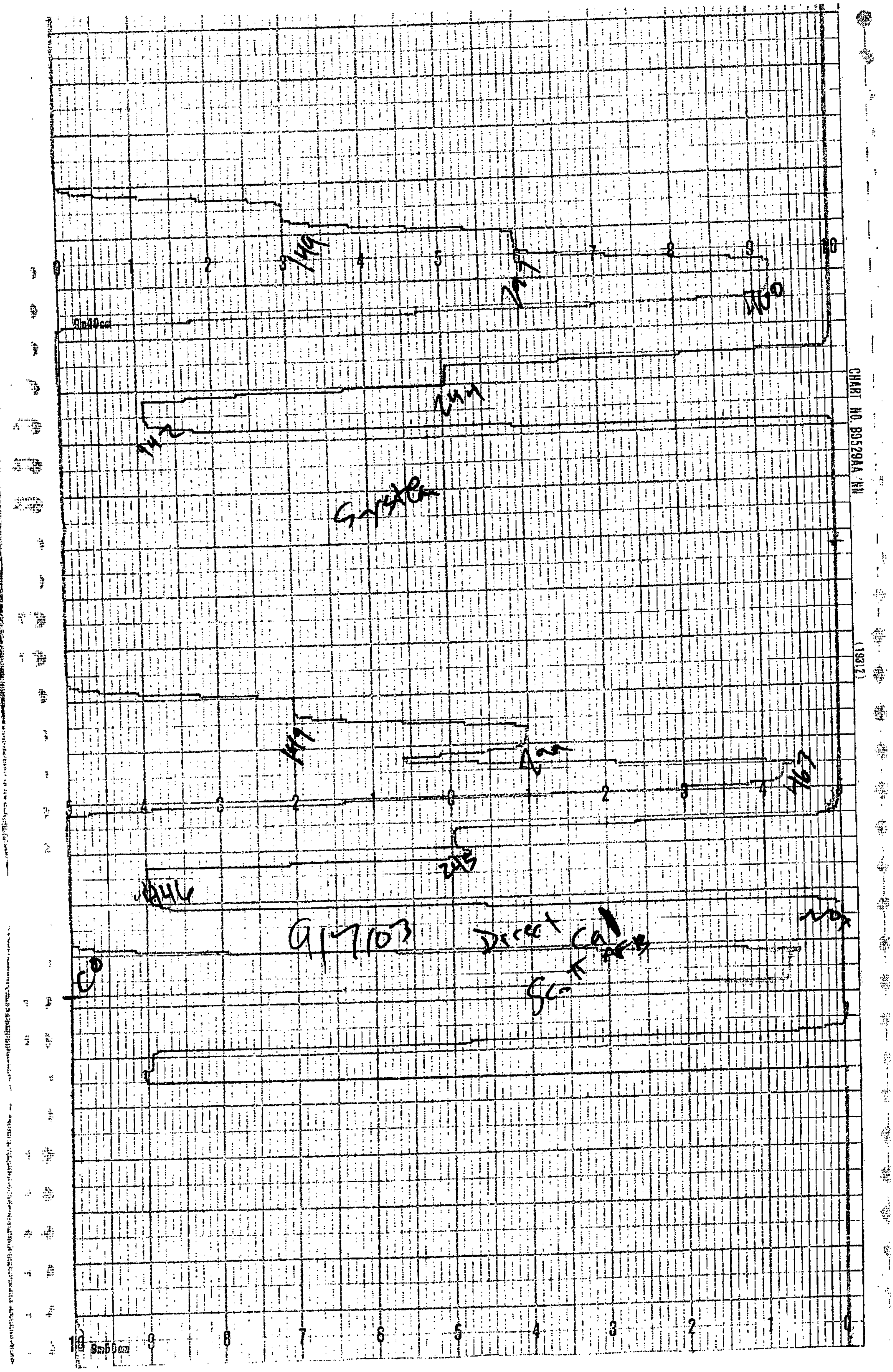
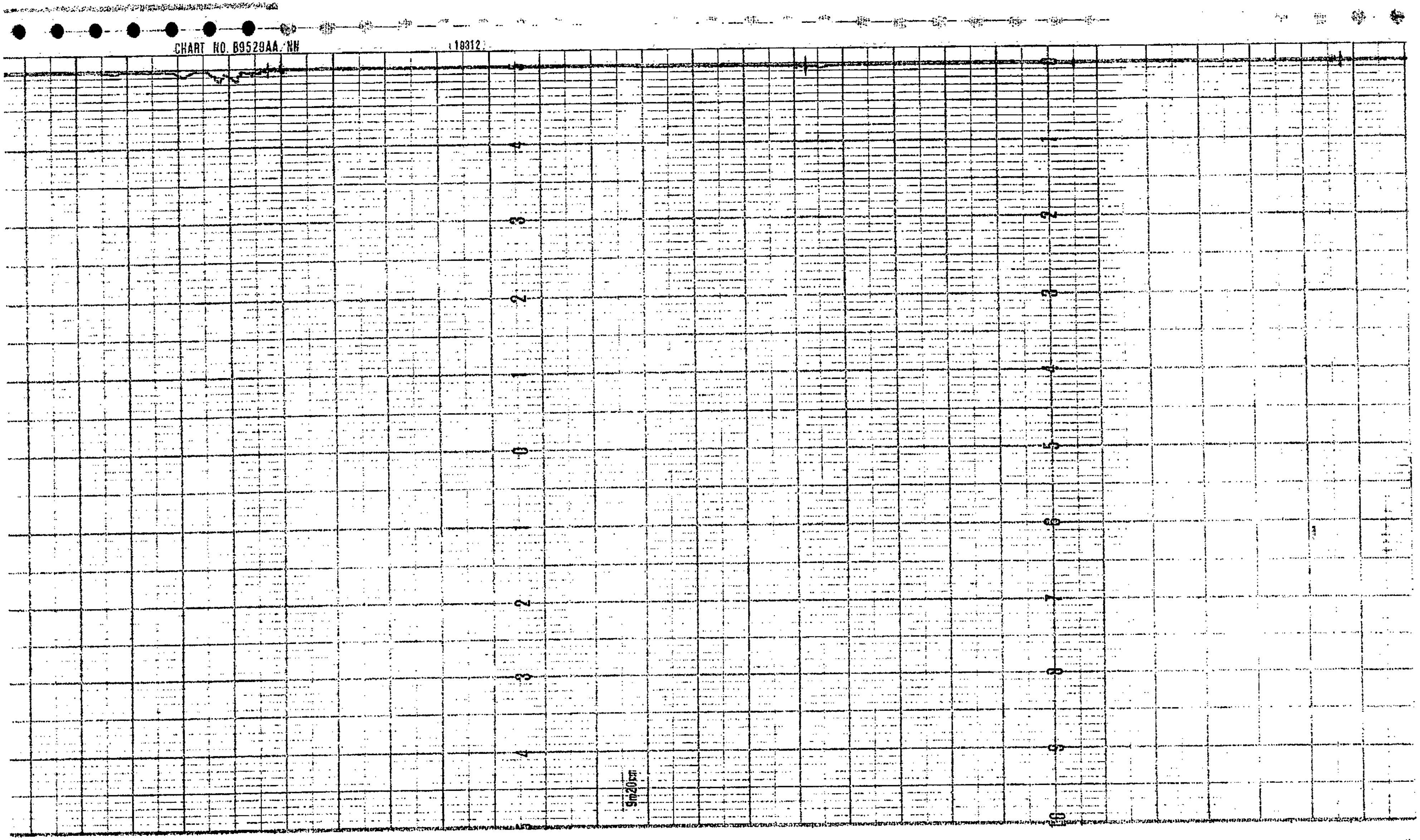


CHART NO. B0529AA
9m40cm
9m50cm
9/7/03
Direct Cal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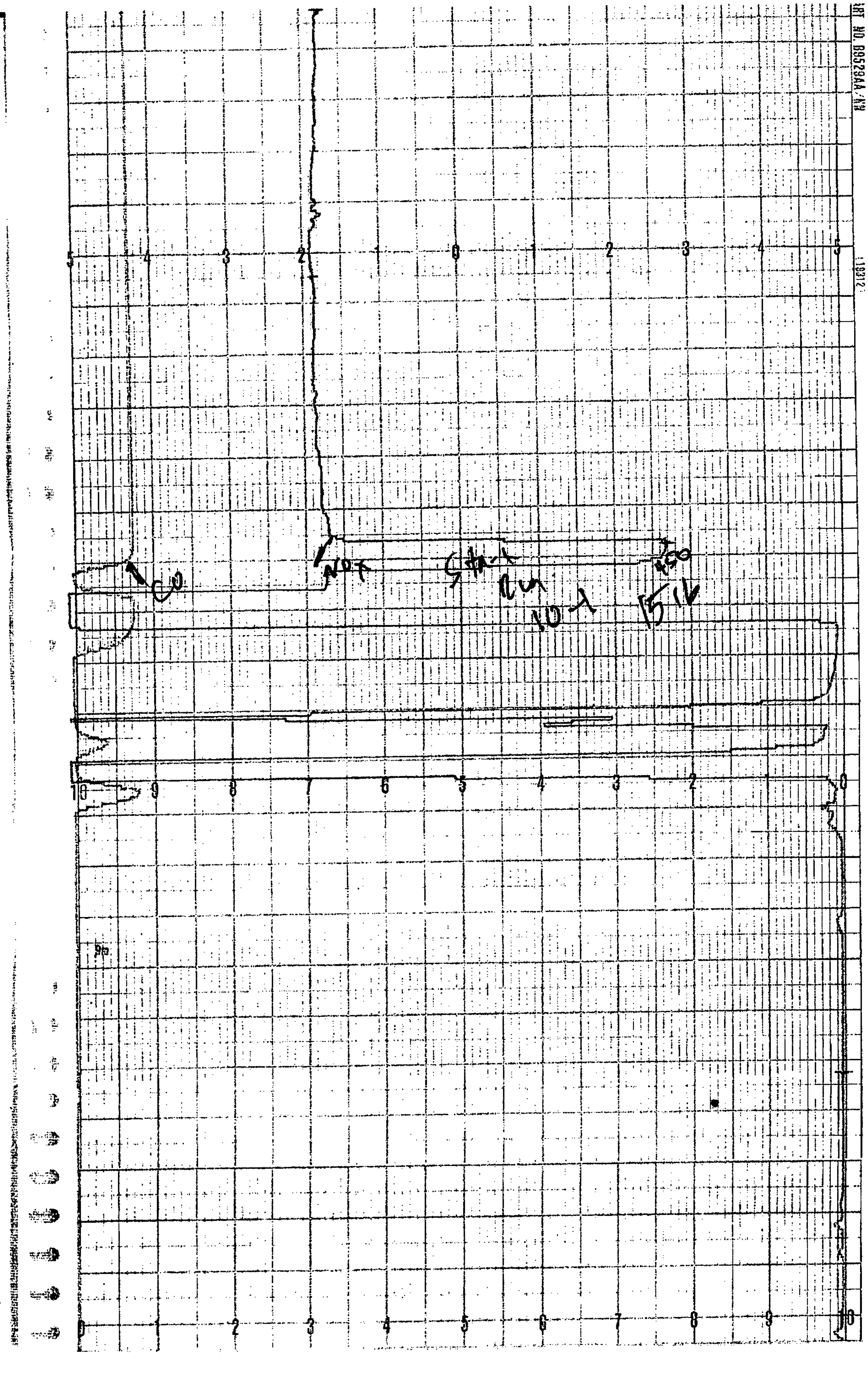
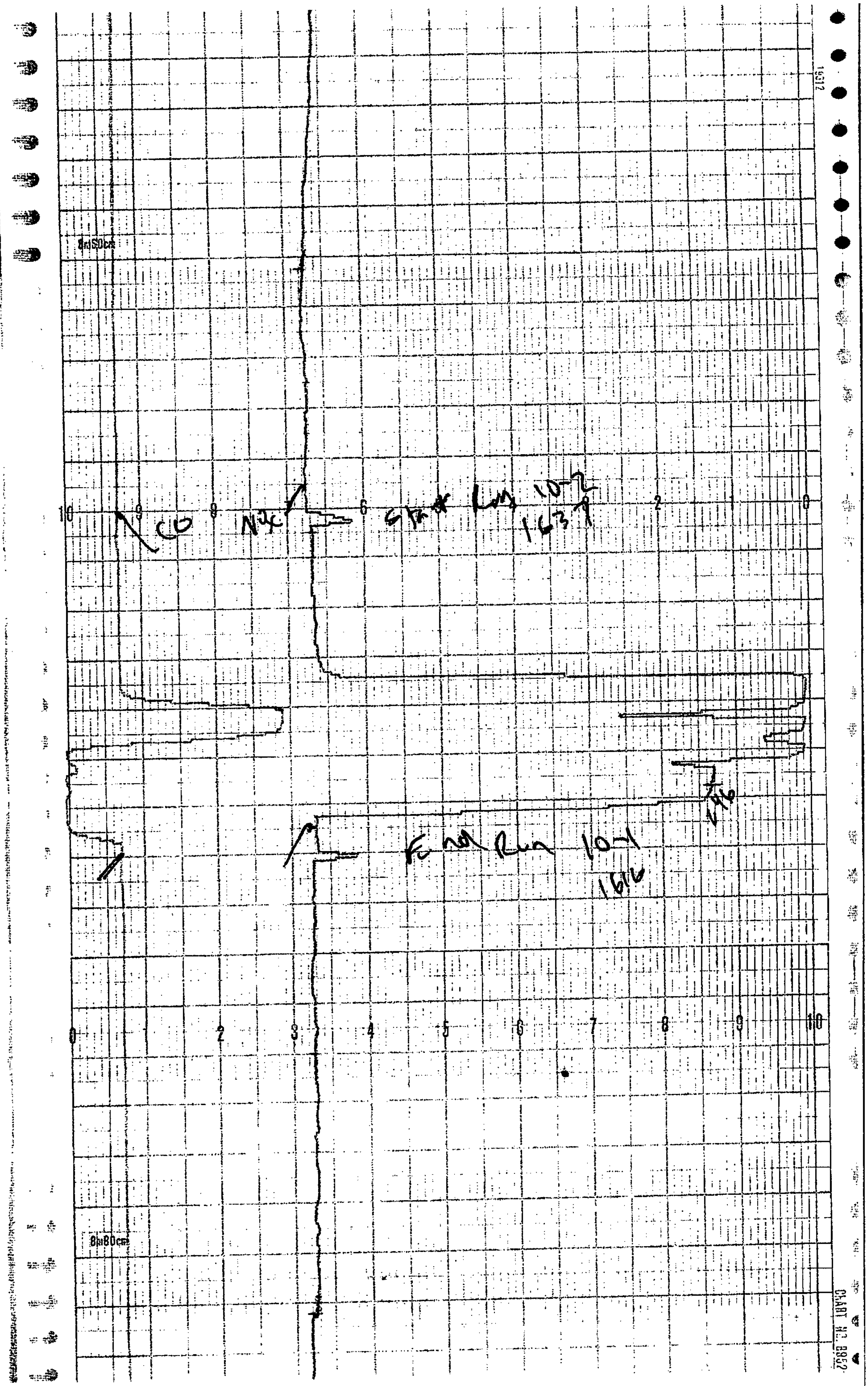
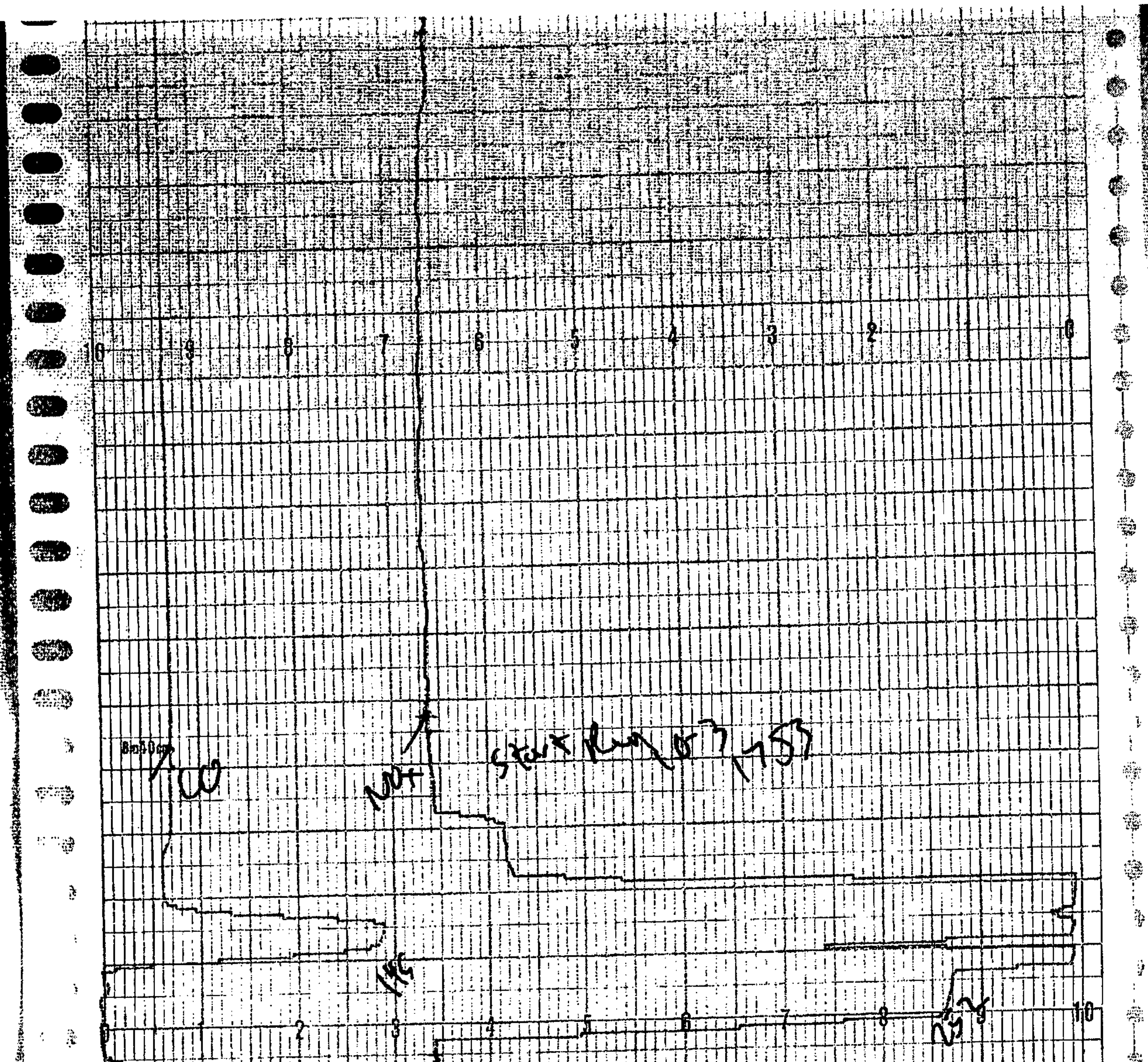
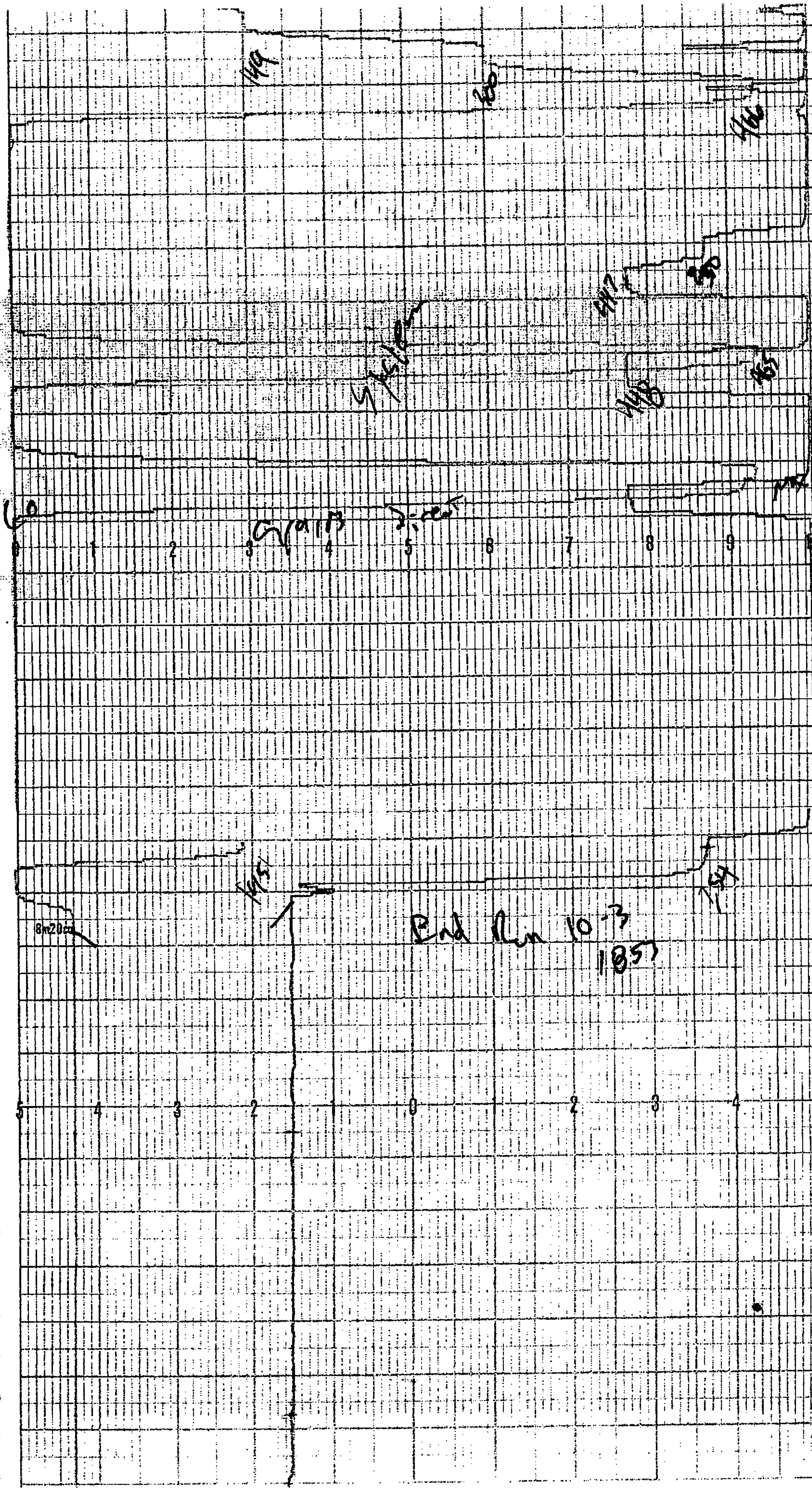
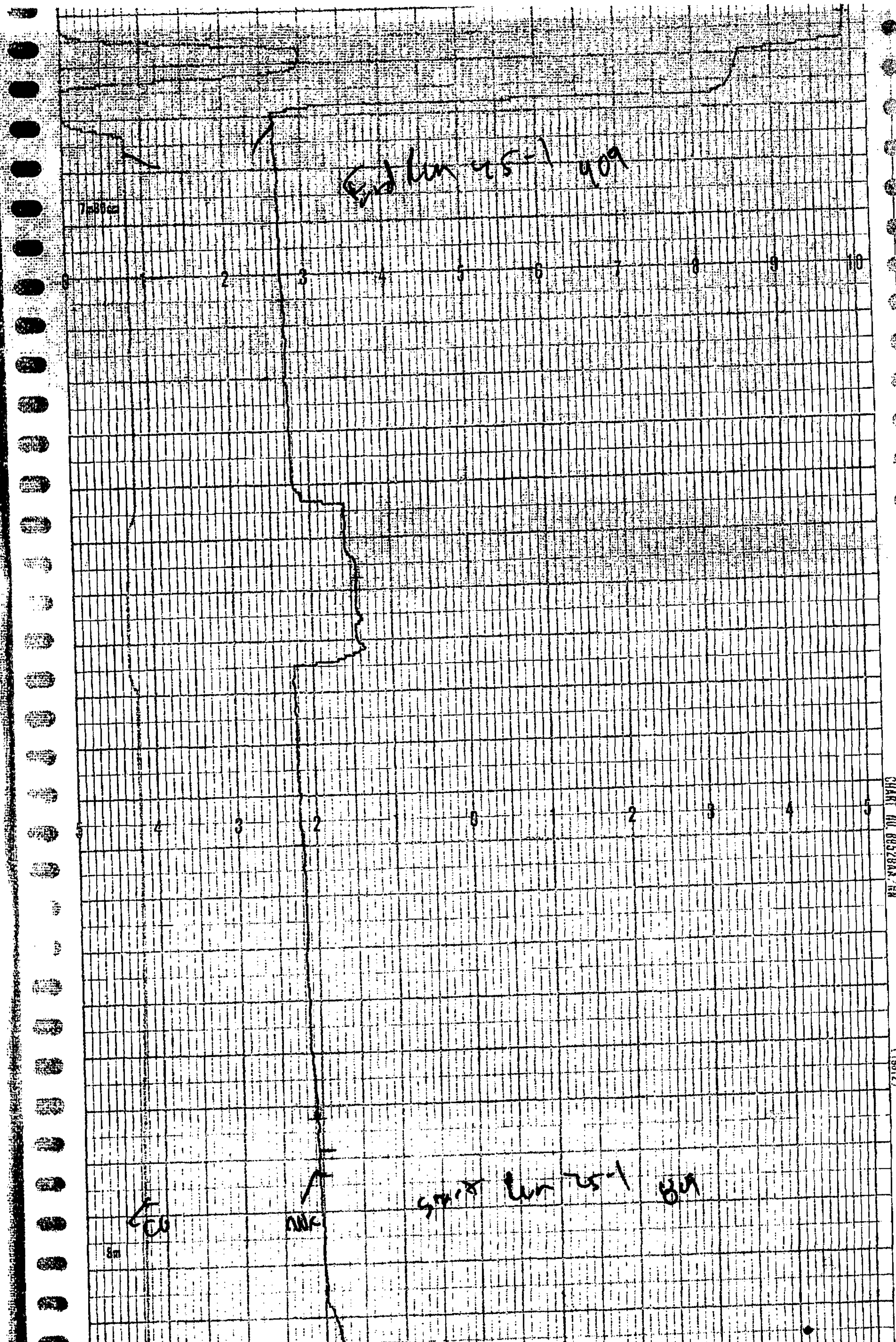
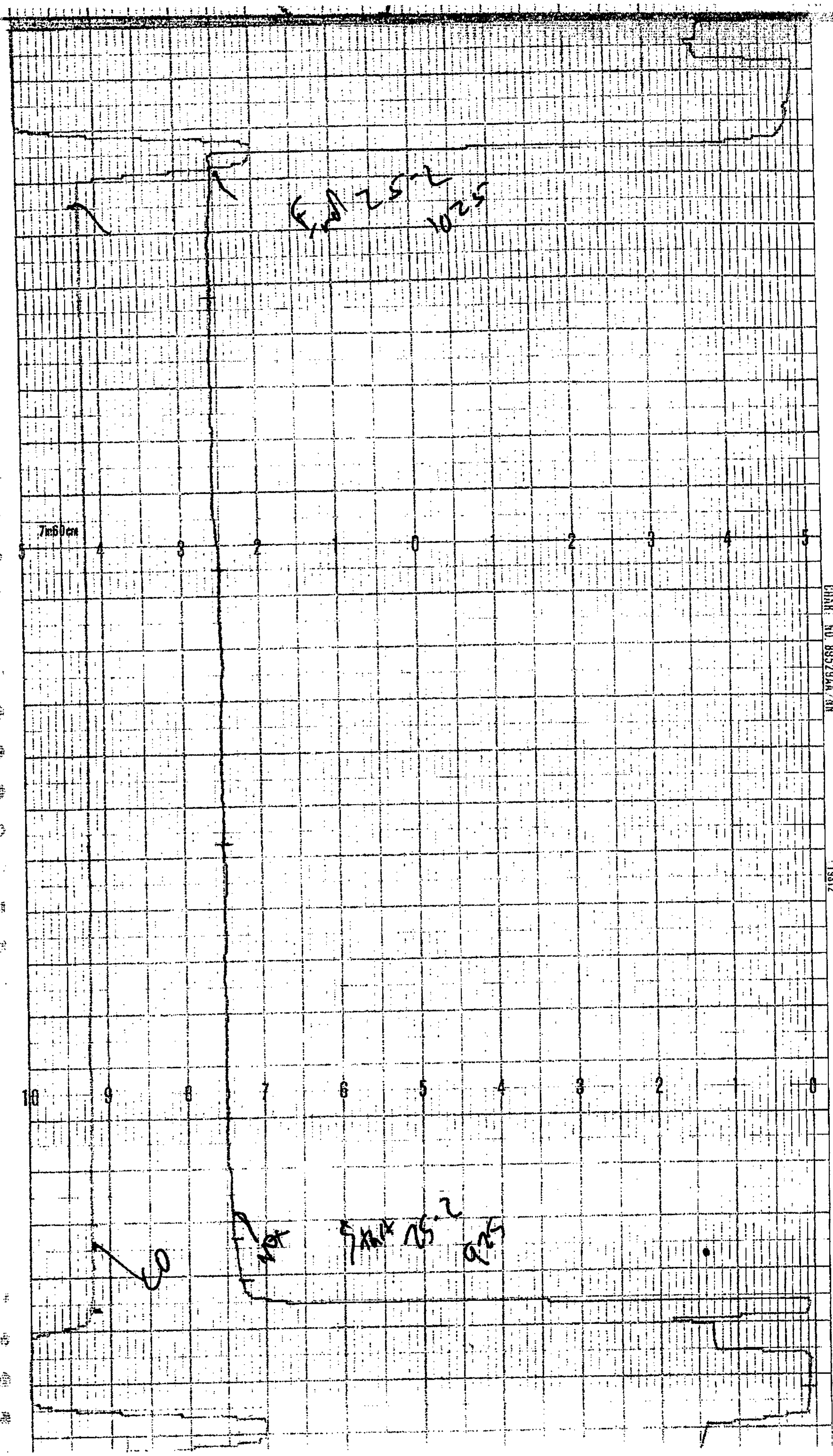


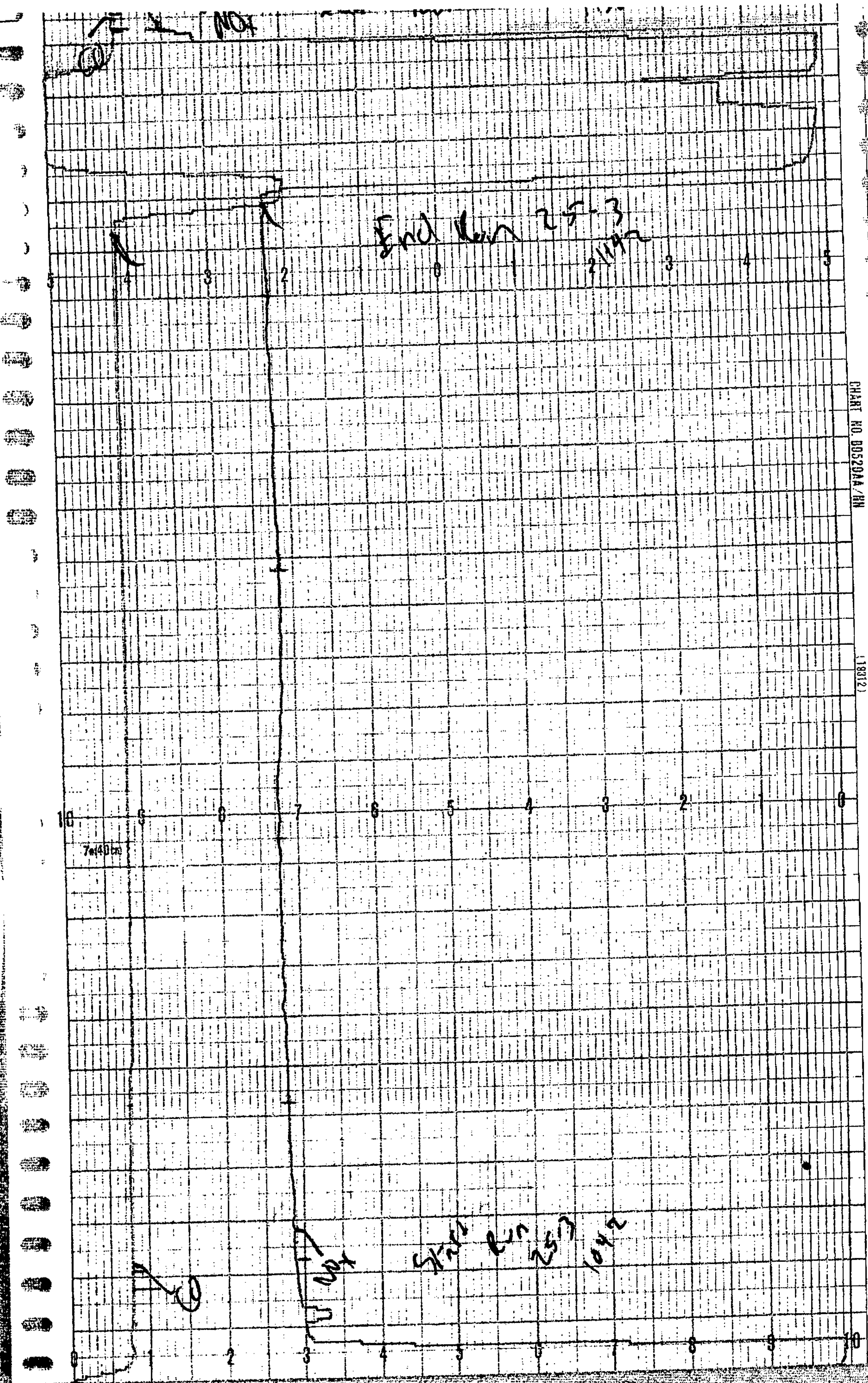

CO
Start Run 10-2
1637
Final Run 10-1
1616
CHART NO. 8952

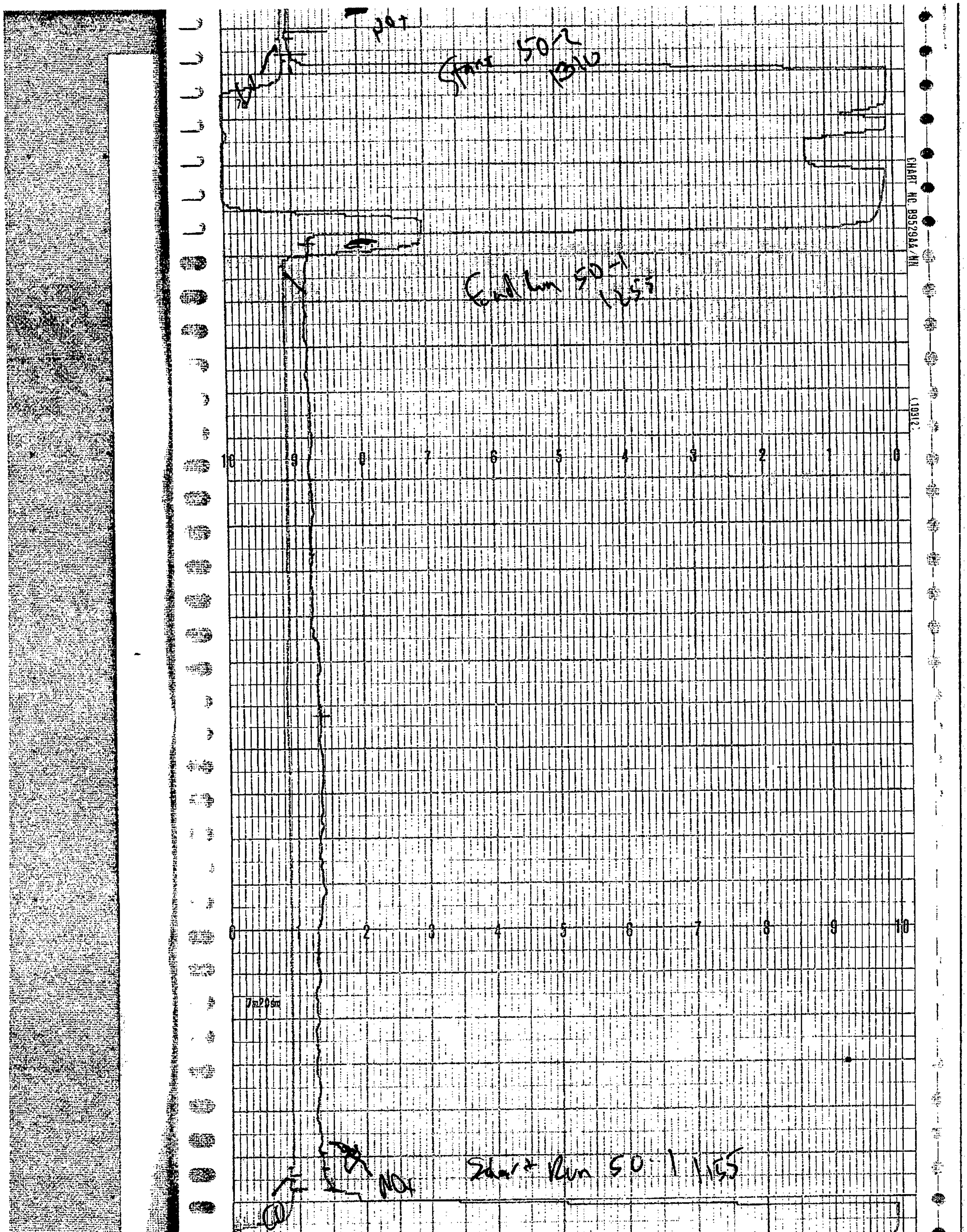

start Run 07 1753
1737
CHART NO. 00523AA-RH

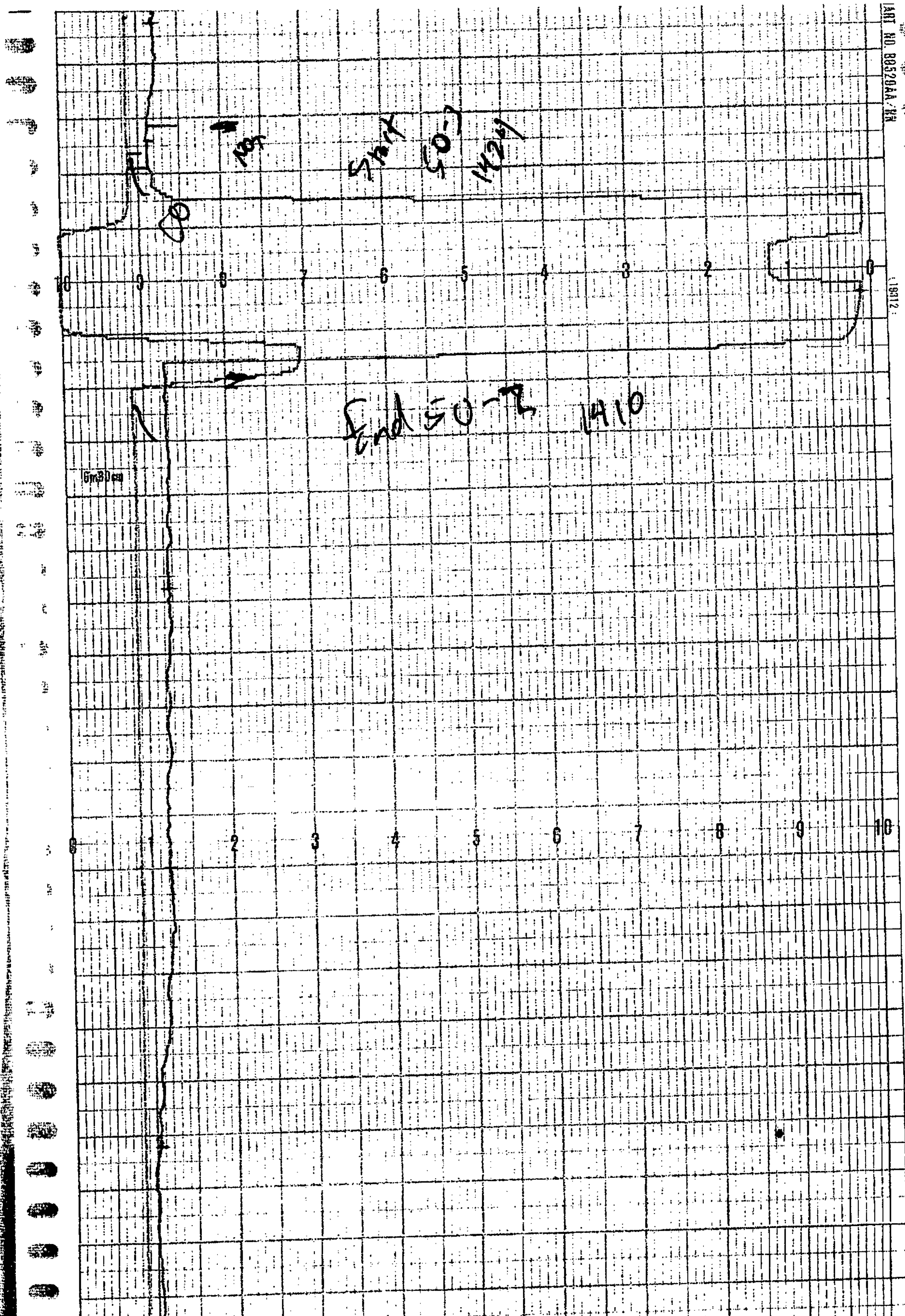

End Run 10-3
1857
CHART NO. 39529AA


End Run 45-1 909
CO
NOx
Start Run 45-1


7in60cm
CHART NO 89529AA/NN
19812


NOx
CO
End Run 25-3
1142
Start Run 25-3
1042
CHART NO. DD520AA/NN


NOx
Start 50-2 1310
End Run 50-1 1255
CHART NO. B9529AA/NN
11031C
10 9 8 7 6 5 4 3 2 1 0
0 2 3 4 5 6 7 8 9 10
Start Run 50-1 1155
NOx


Start 50-3 1420
End 50-3 1410

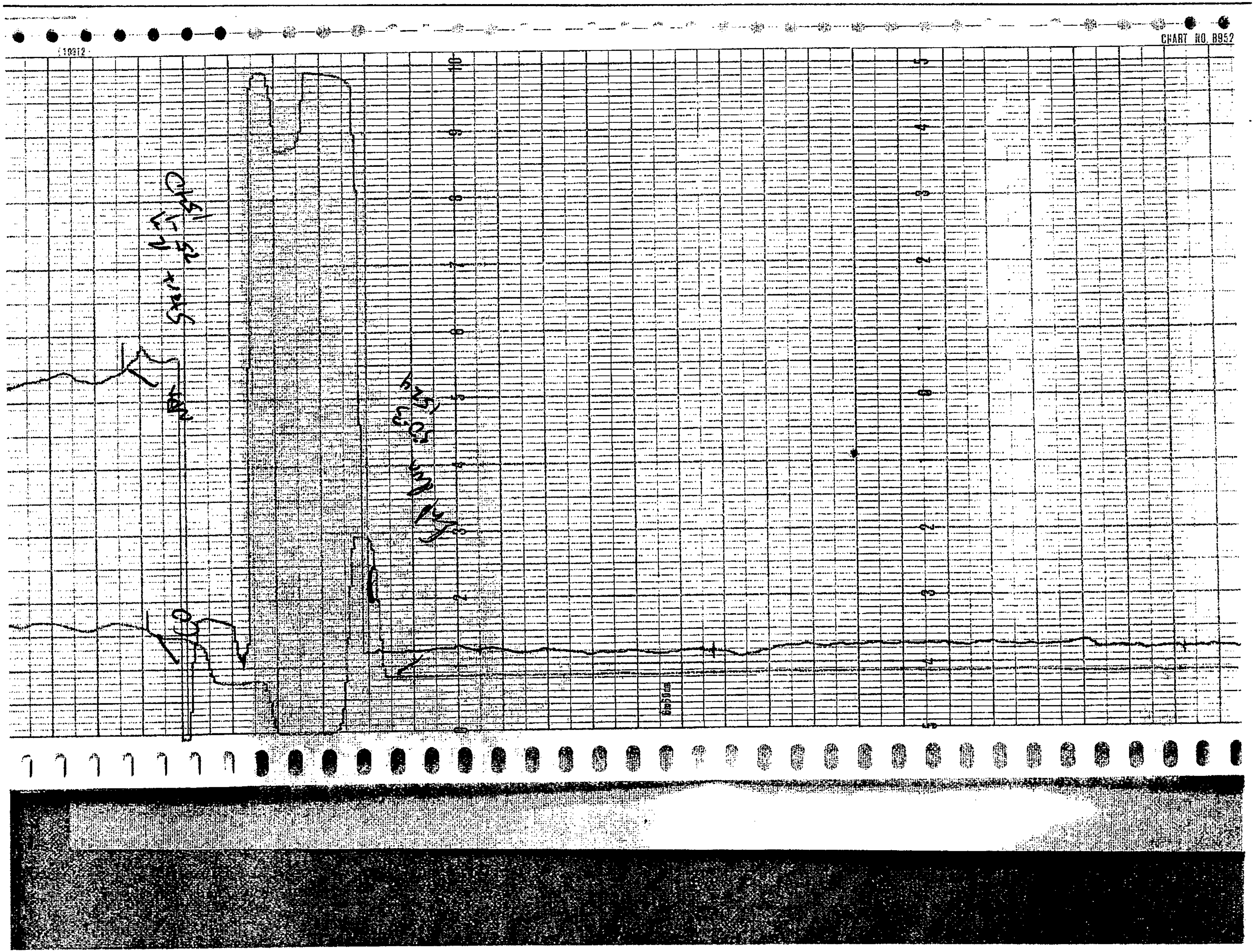
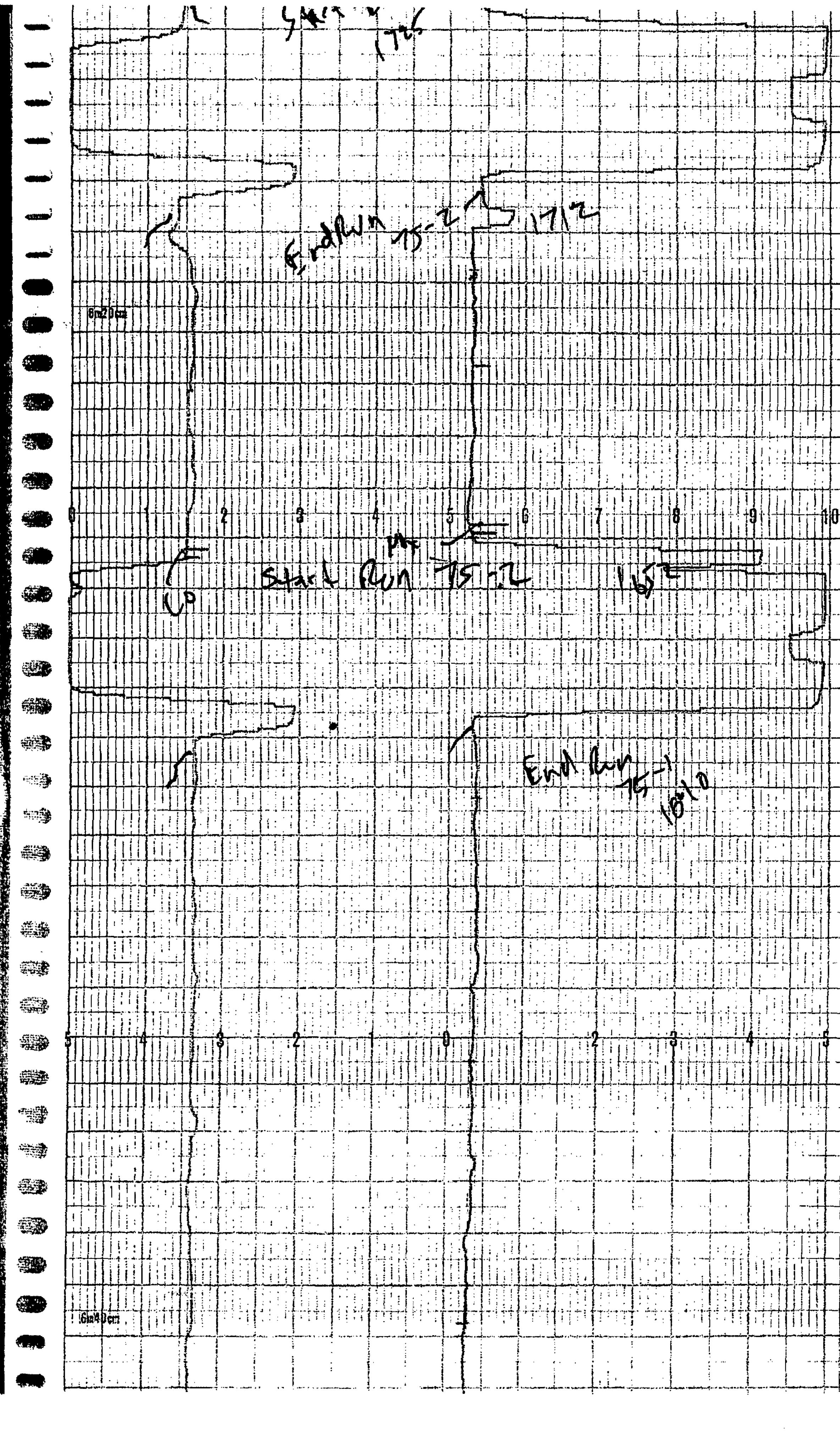
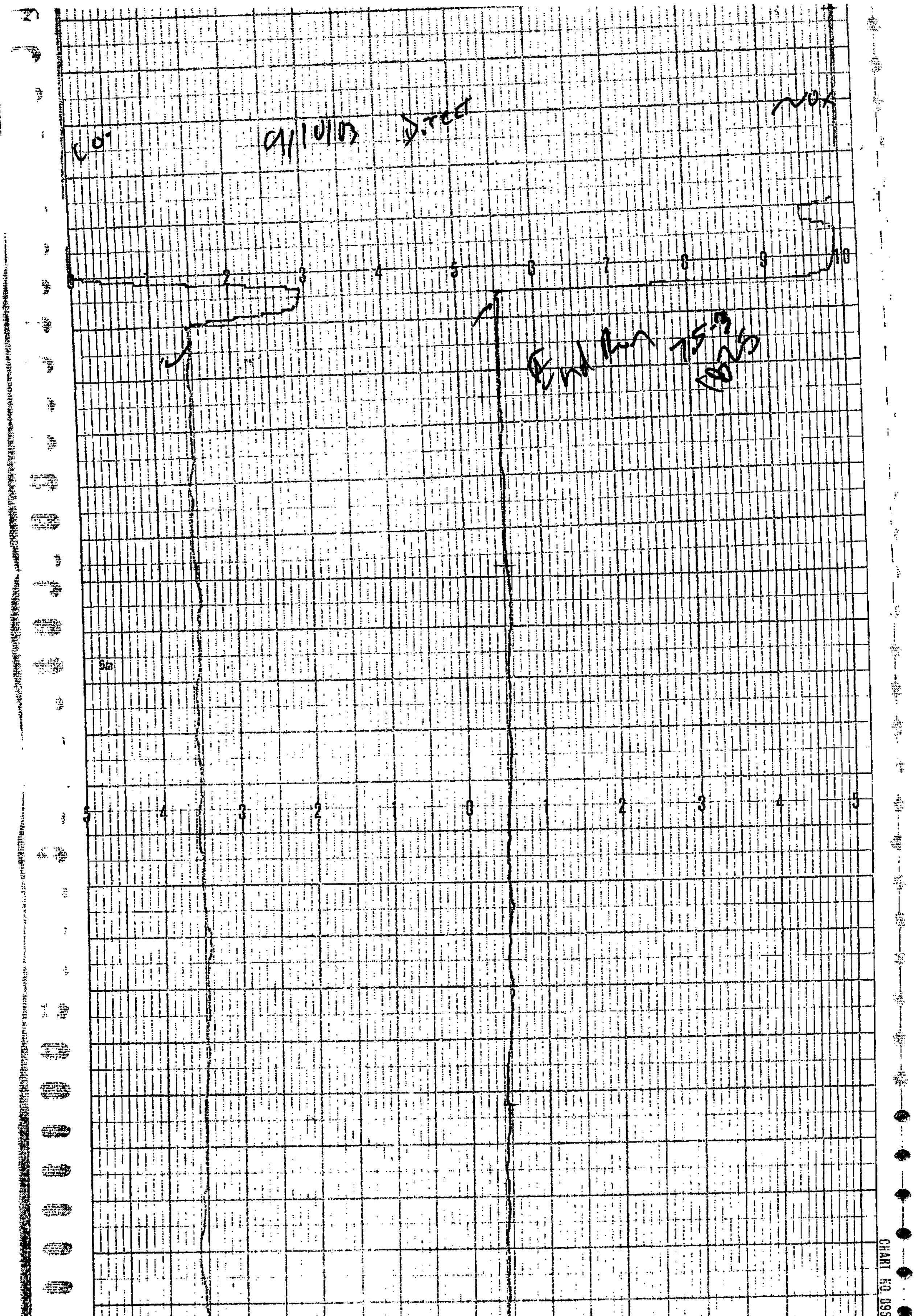
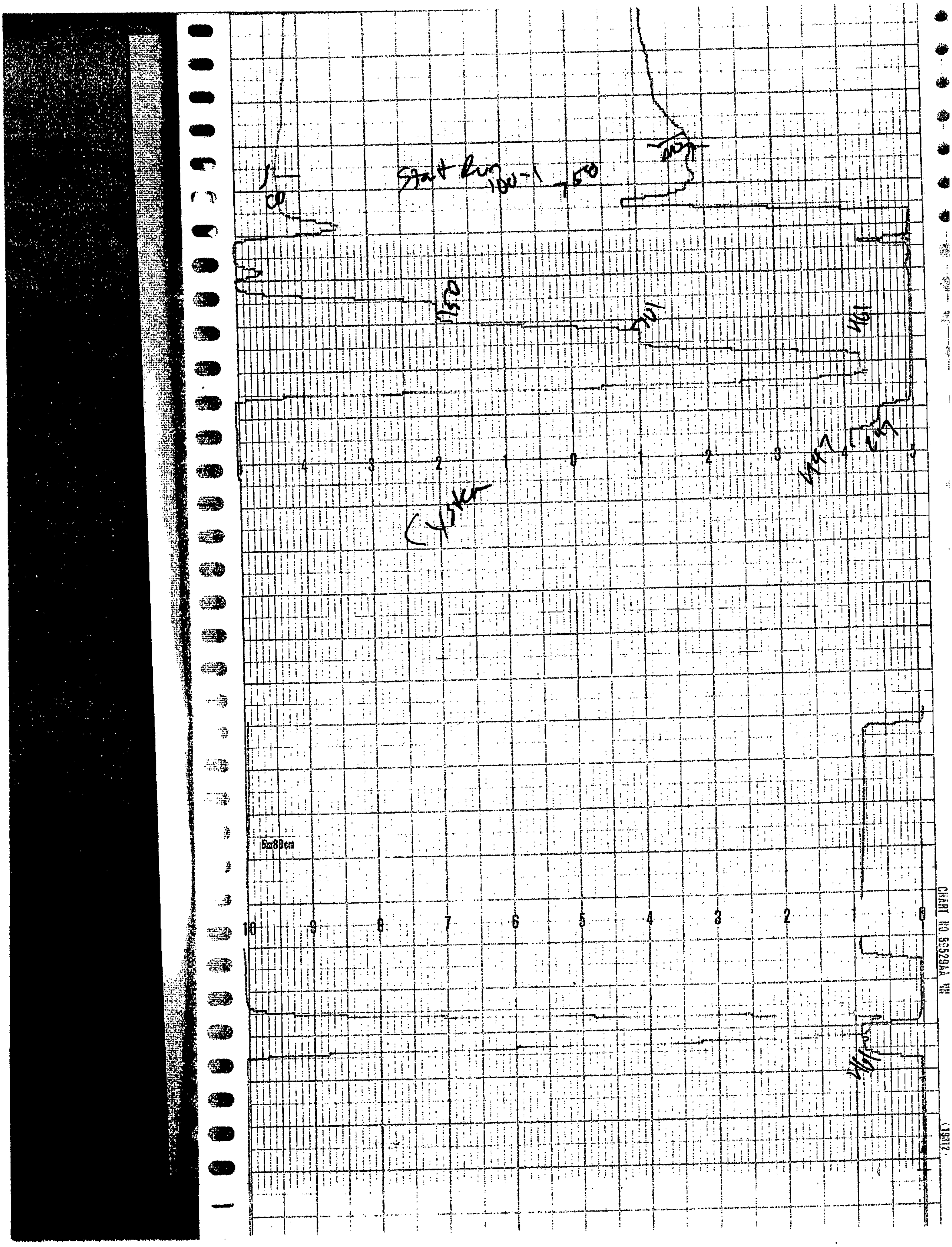


CHART NO. 8952

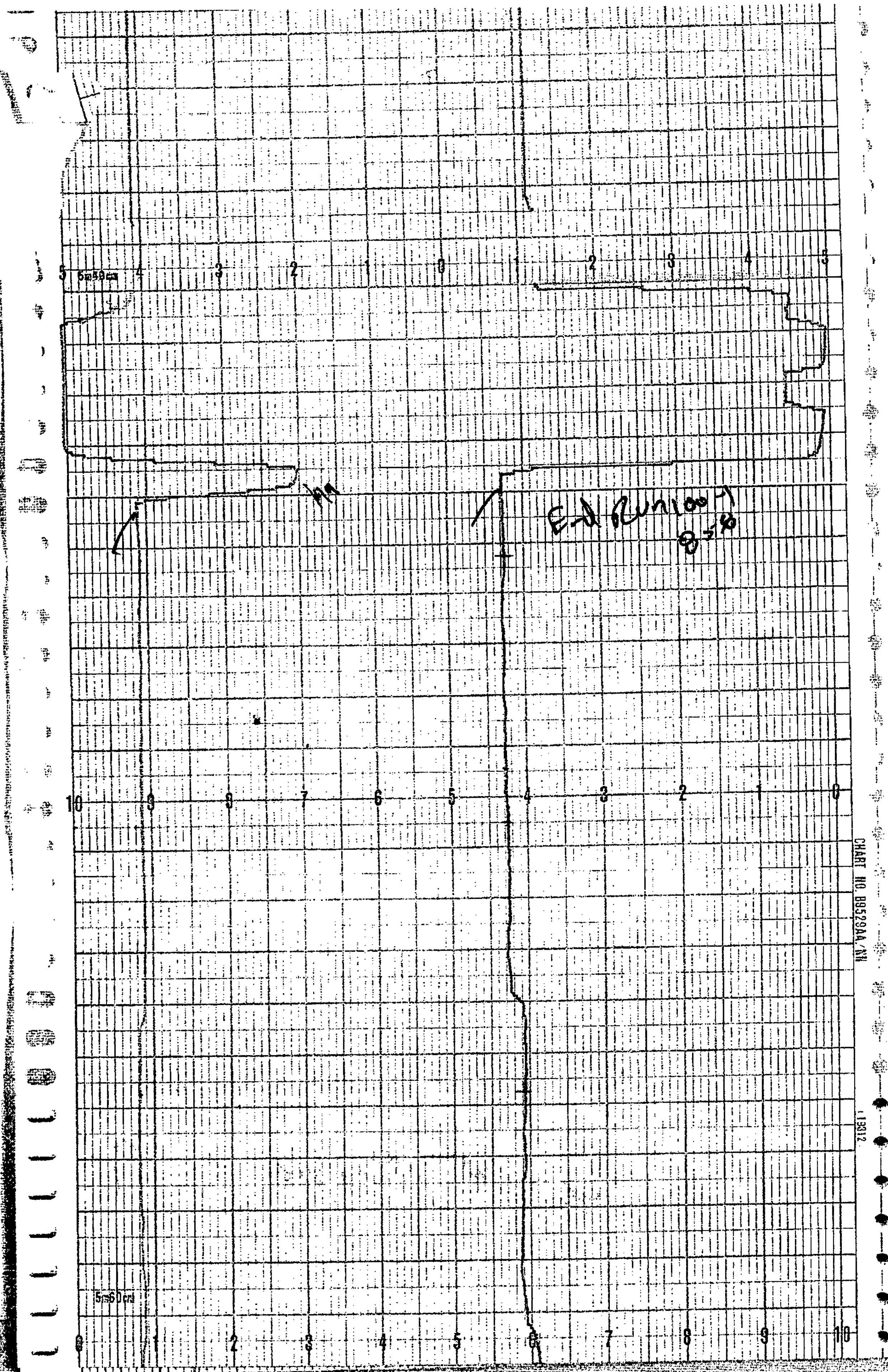

End Run 75-2
1712
6m20cm
0 1 2 3 4 5 6 7 8 9 10
Start Run 75-2
1652
CO
End Run 75-1
5 4 3 2 1 0 1 2 3 4 5
6m40cm

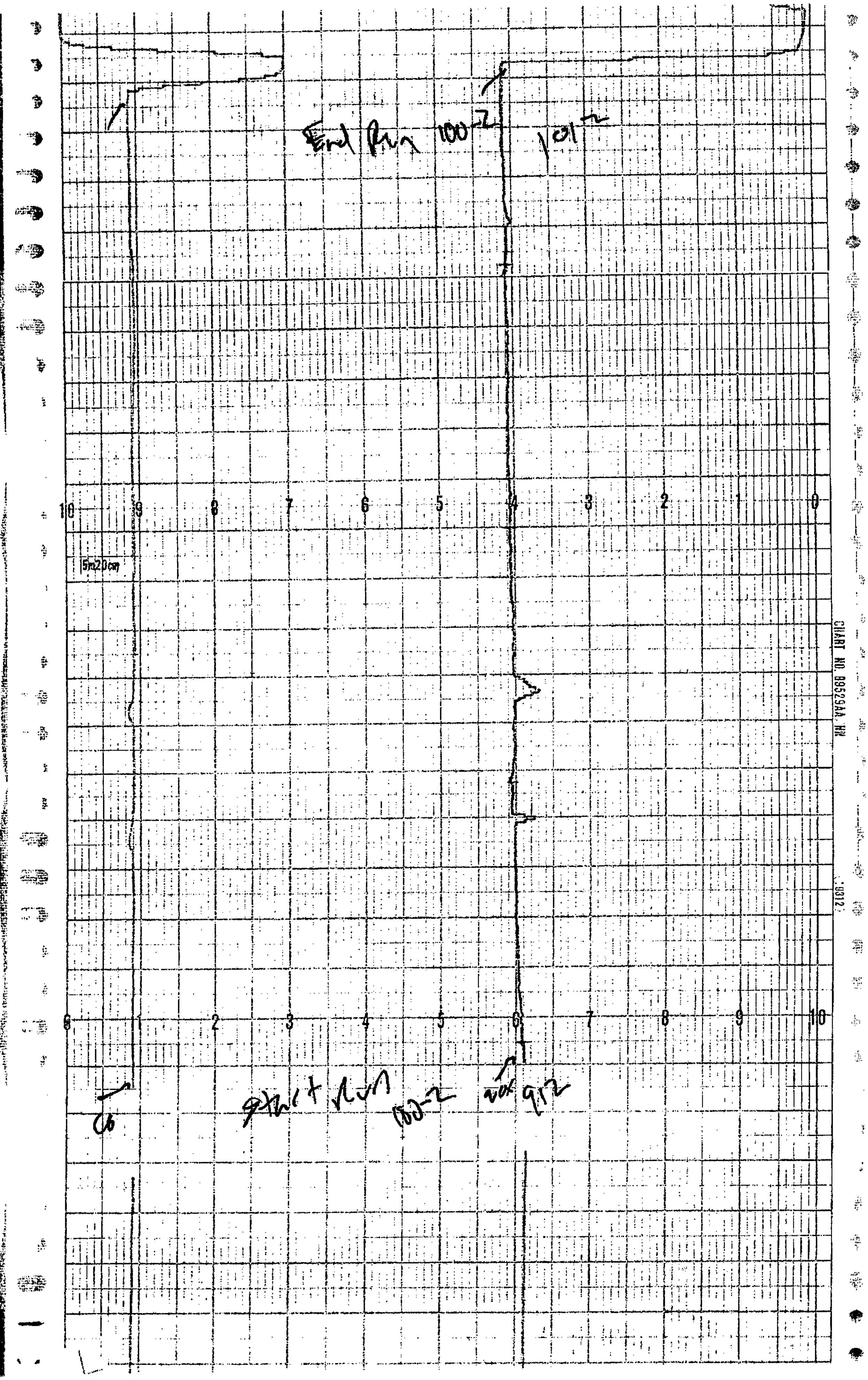


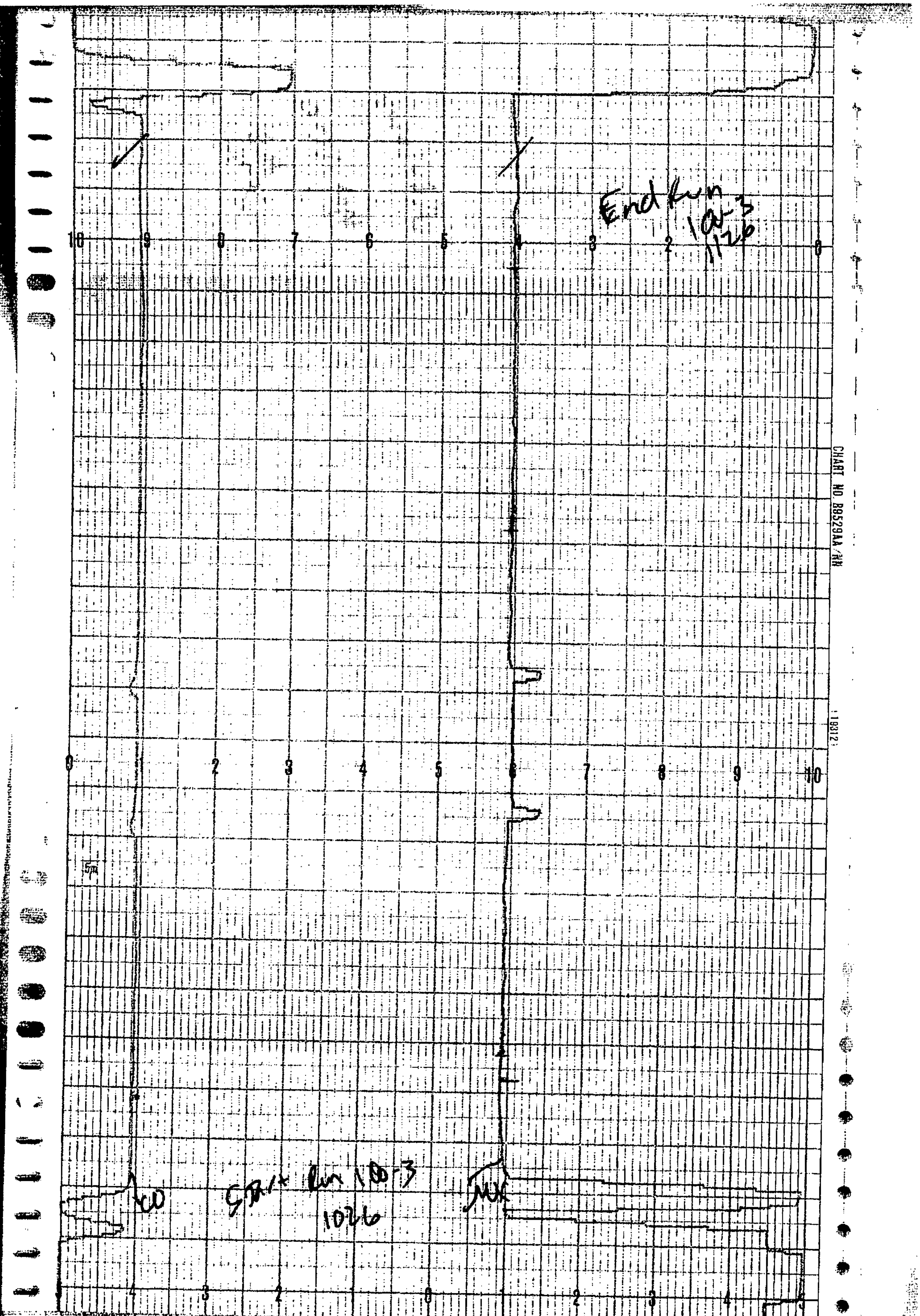
CO
9/10/03
Direct
NOx
End Run
CHART NO. 095294A



Start Run 100-1 750
CO
5x80cm
CHART NO 65529AA


End Run 100-1
CHART NO. B9529AA/NN


End Run 100-2
101-2
10 9 8 7 6 5 4 3 2 1 0
Start Run 100-2
0 1 2 3 4 5 6 7 8 9 10
CHART NO.


End Run 10-3
1126
CHART NO. B8529AA/NN
Start Run 10-3
1026
CO
NOx

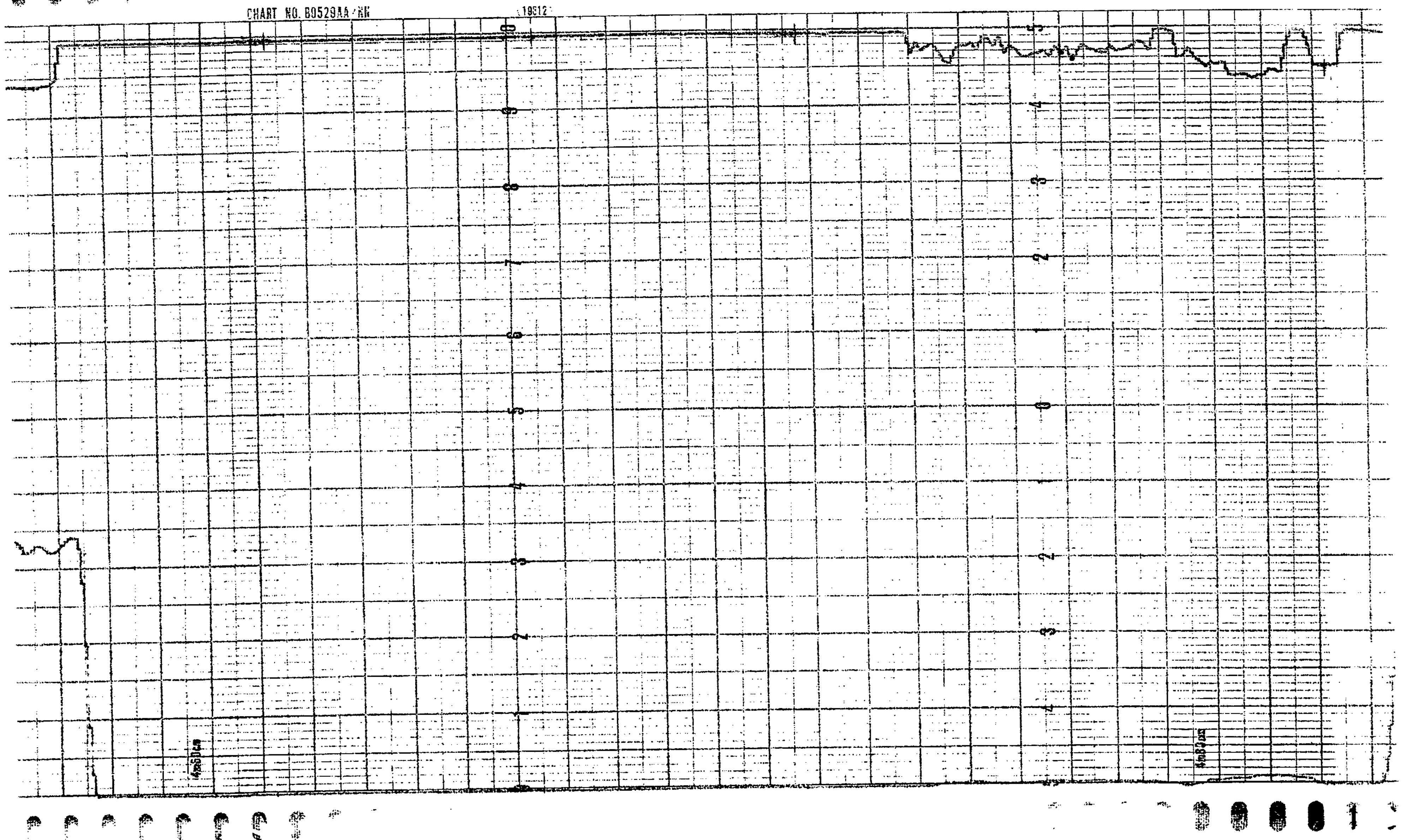
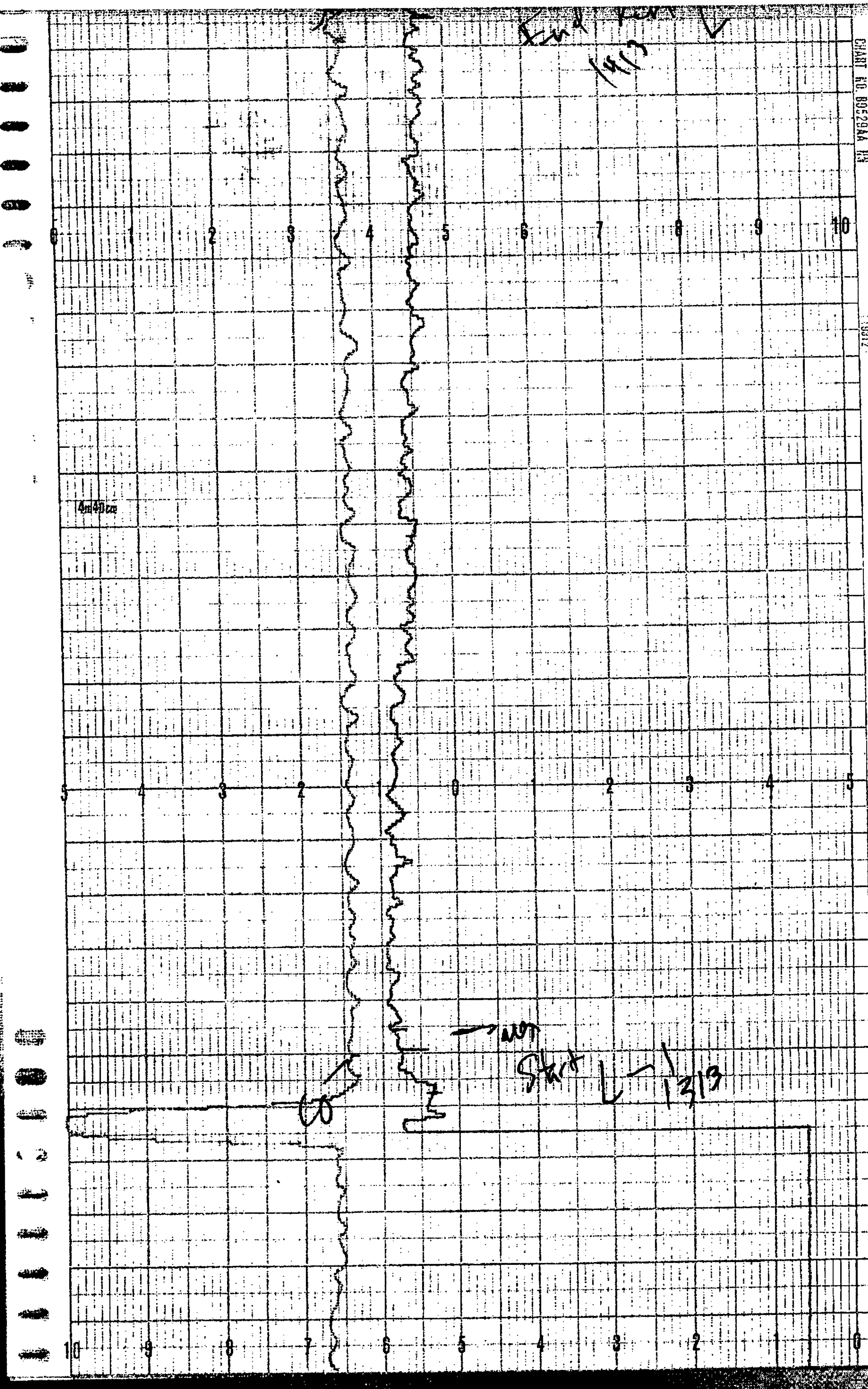
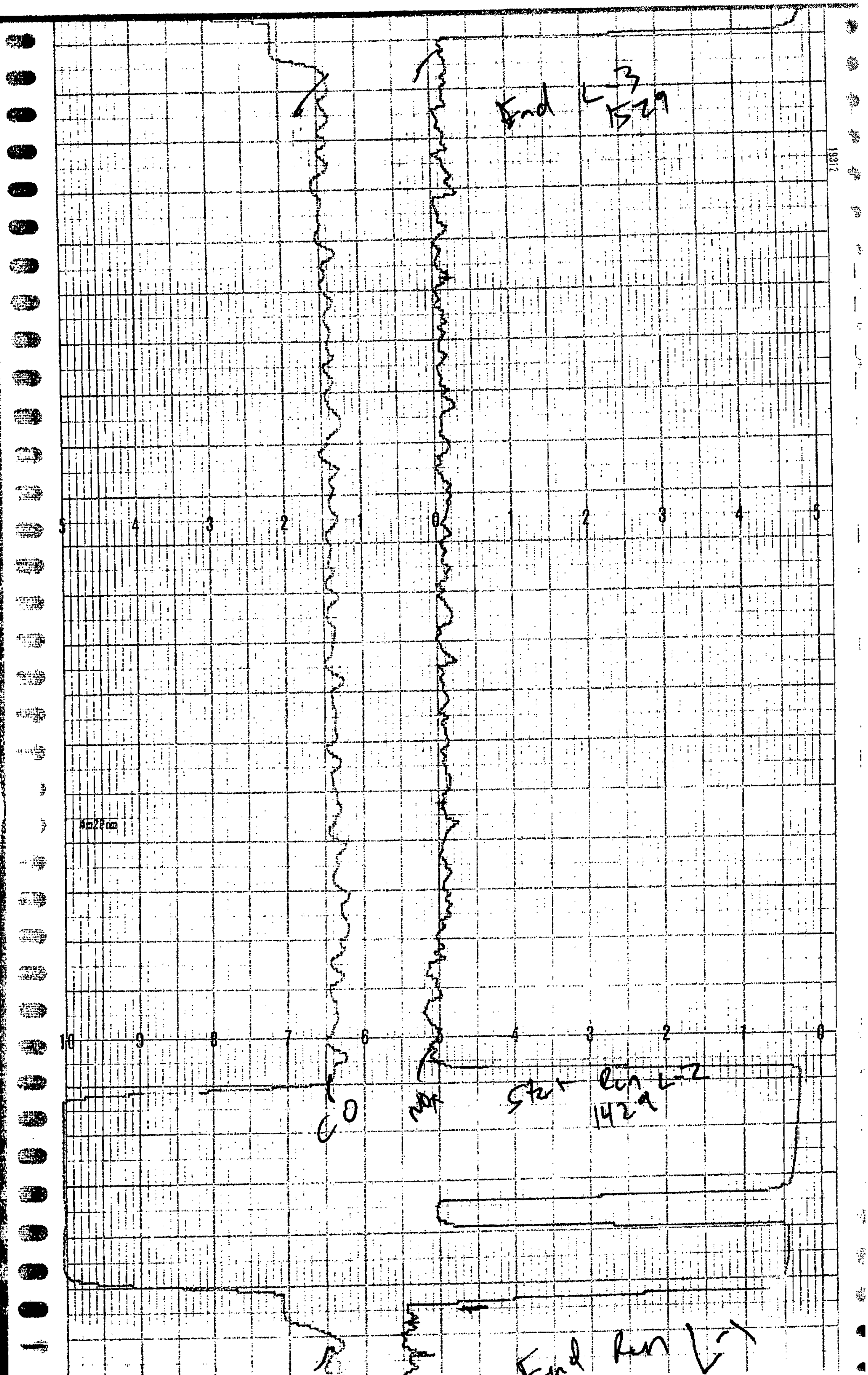
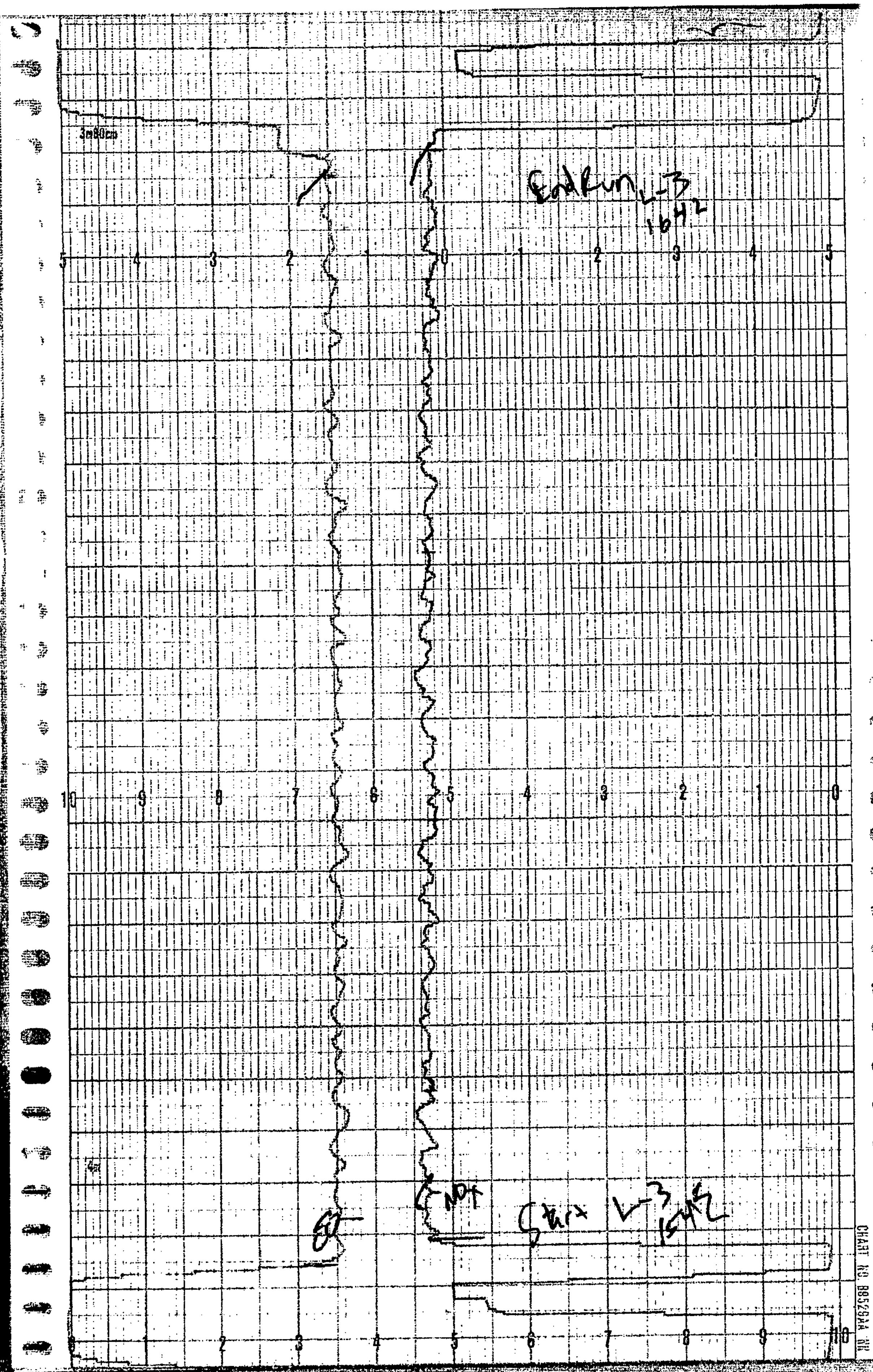


CHART NO. B0529AA/NK
4m60cm
4m83cm


0 1 2 3 4 5 6 7 8 9 10
5 4 3 2 1 0 1 2 3 4 5
10 9 8 7 6 5 4 3 2 1 0
Start
1313
CO



End L-3
1529
5 4 3 2 1 0 1 2 3 4 5
10 9 8 7 6 5 4 3 2 1 0
CO
NOx
Start Run L-2
1429
End Run L-1



3m80cm
End Run L-3 16H2
5 4 3 2 1 0 1 2 3 4 5
10 9 8 7 6 5 4 3 2 1 0
4m
NO₄
Start L-3 16H2
0 1 2 3 4 5 6 7 8 9 10
CHART NO. 8852AA

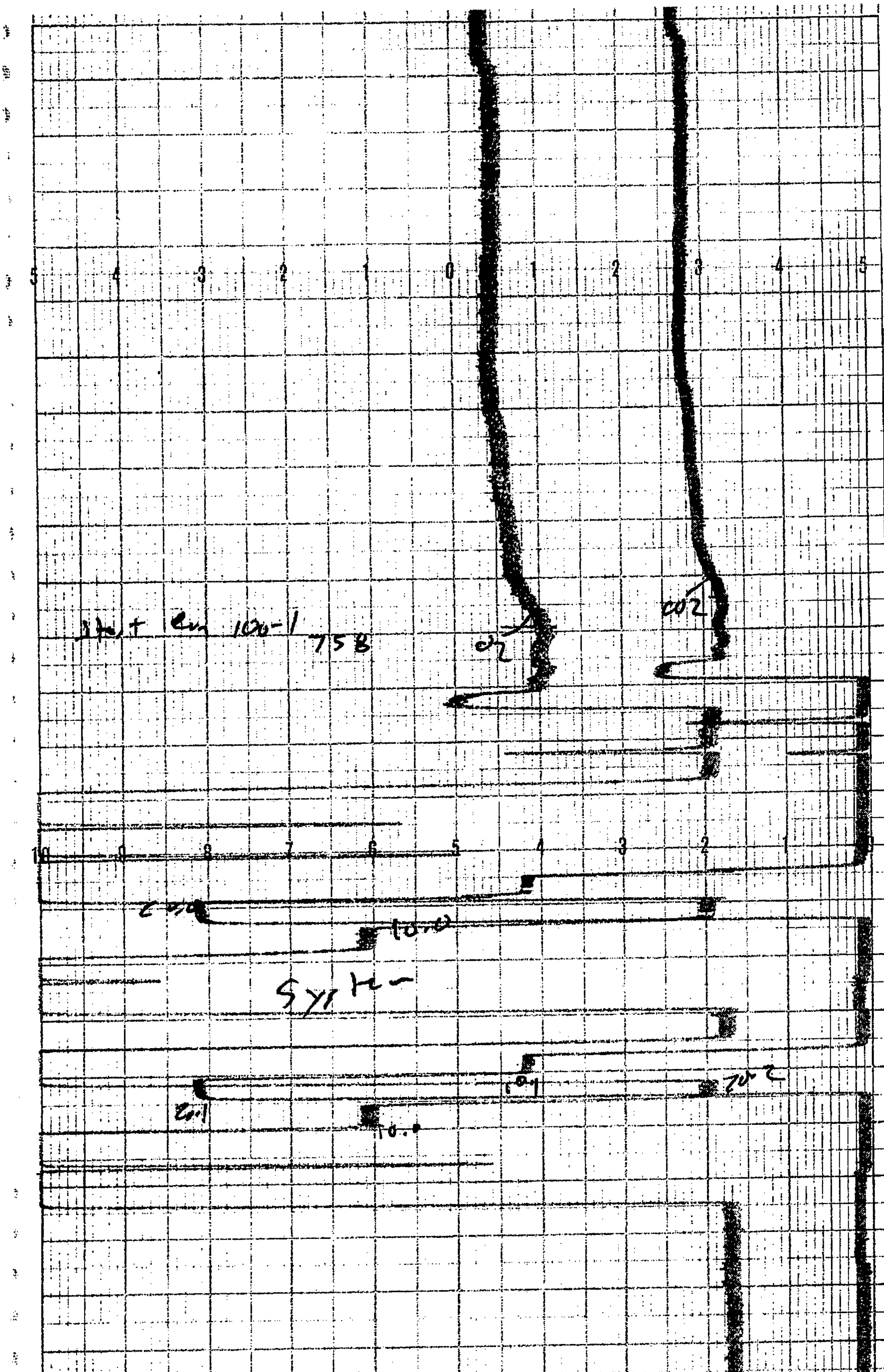


CHART NO. B9529AA
CO2
O2
10.0
9/18/03

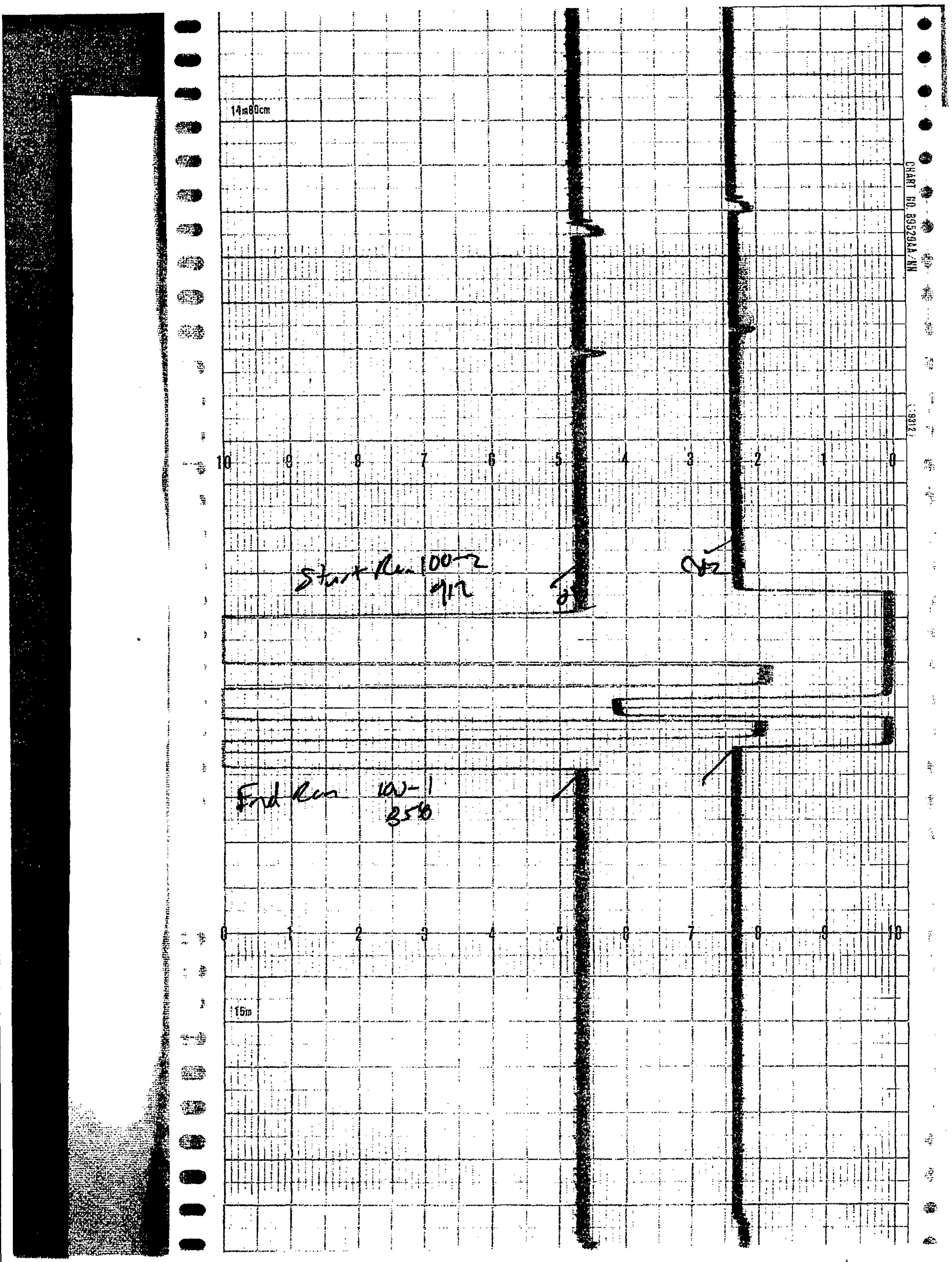


CHART NO. B9529AA-NN
(9312)
14m80cm
10 9 8 7 6 5 4 3 2 1 0
Start Run 100-2
912
End Run 100-1
858
0 1 2 3 4 5 6 7 8 9 10
15m

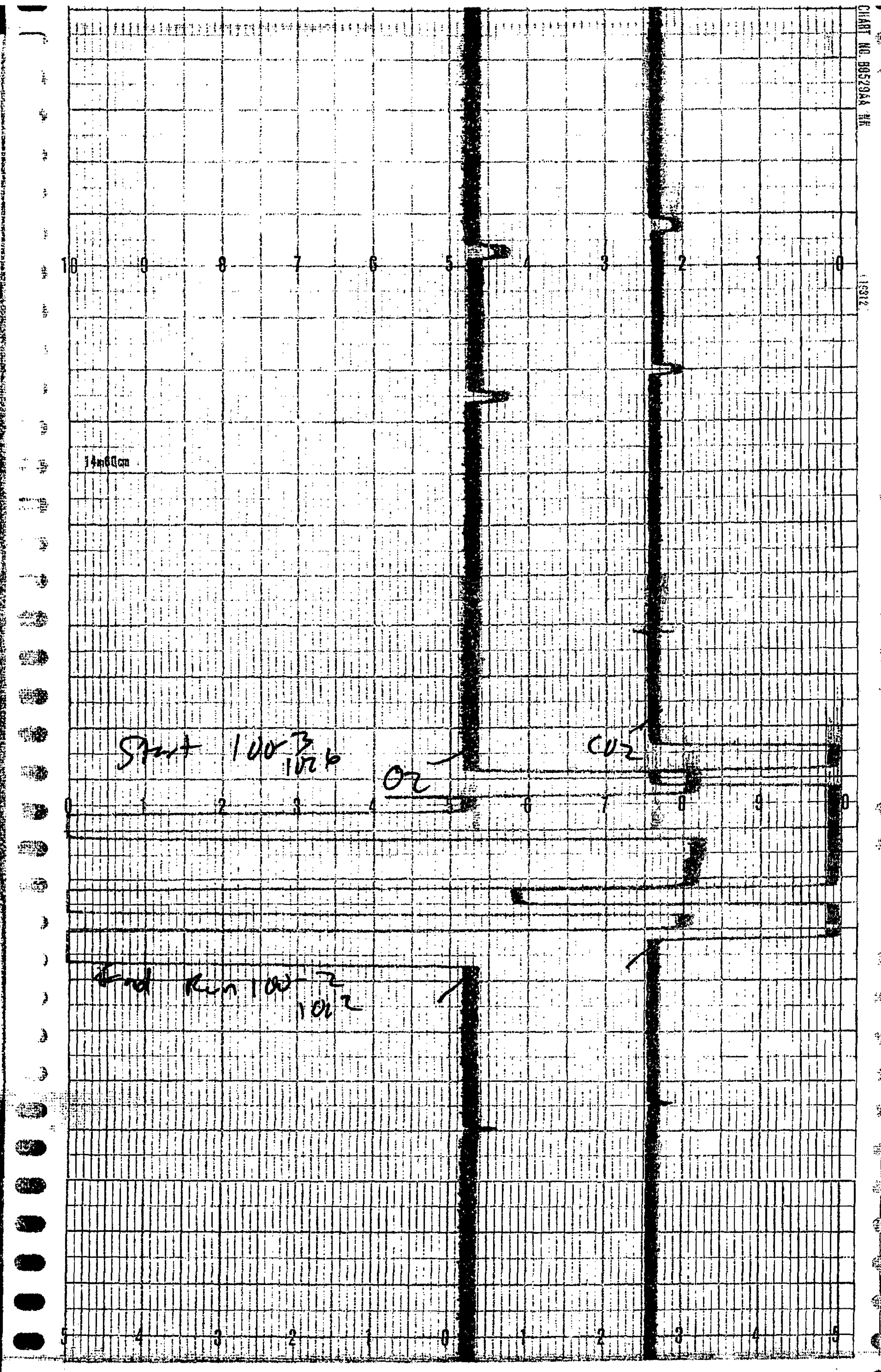
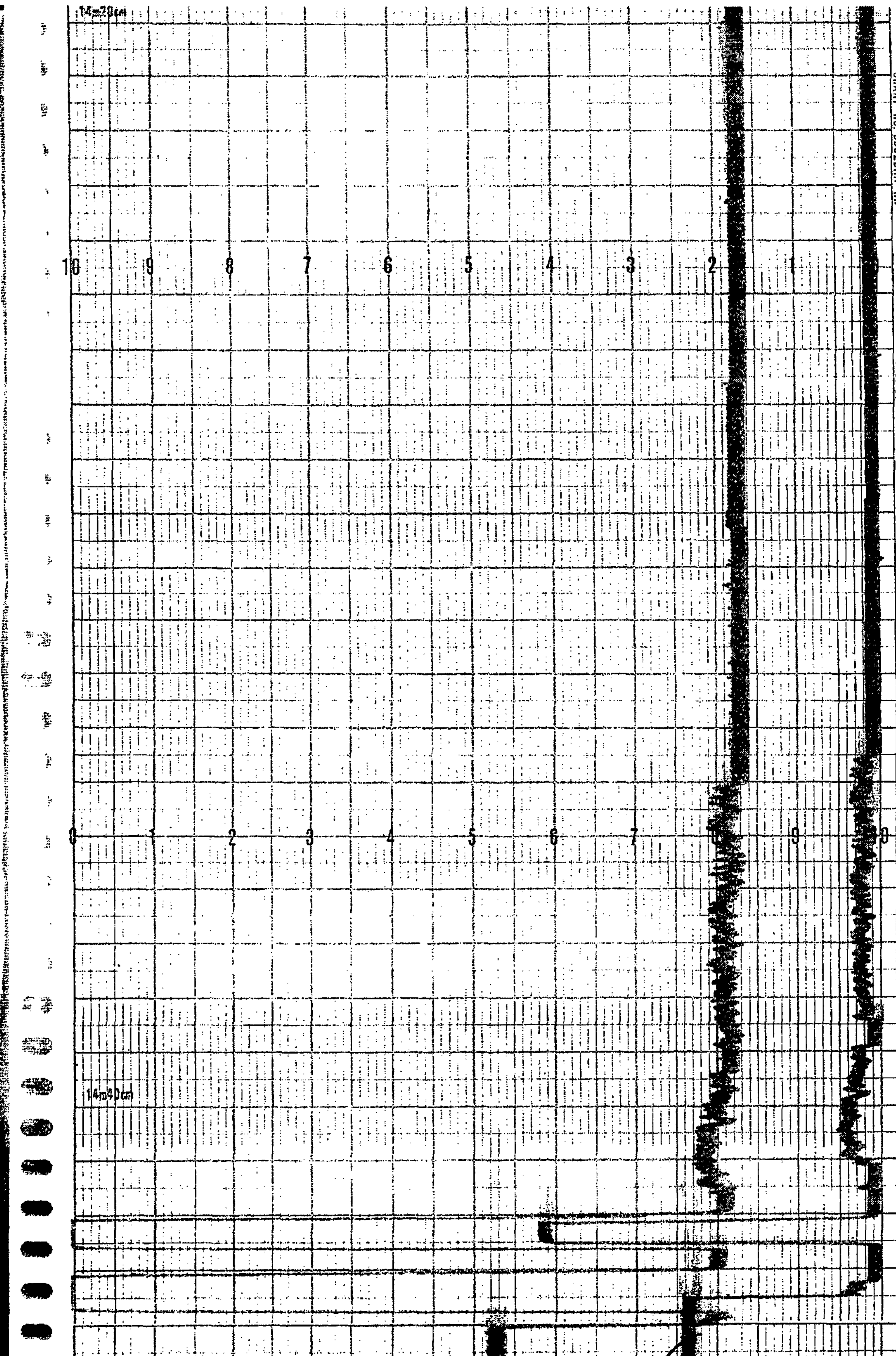
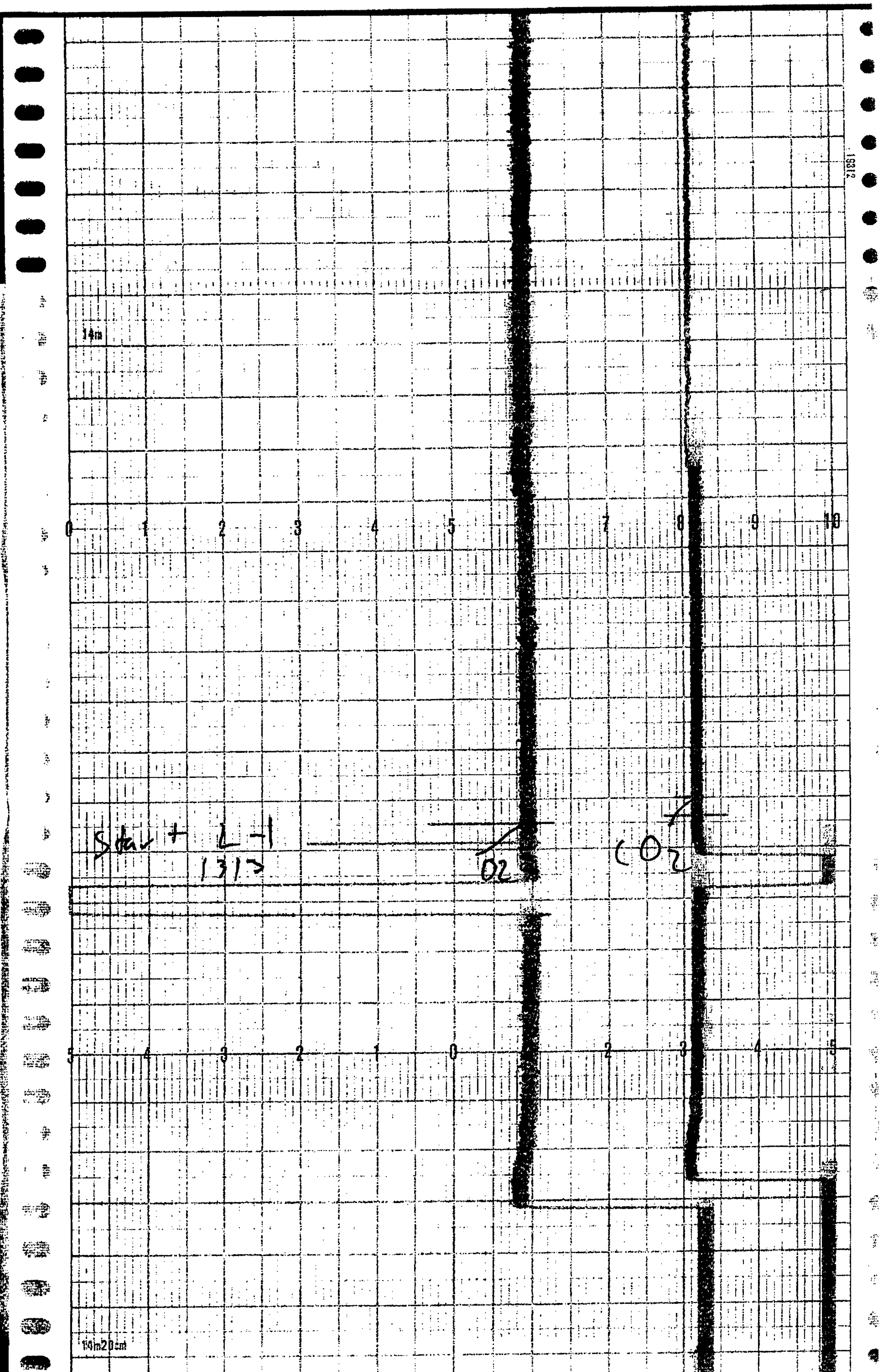
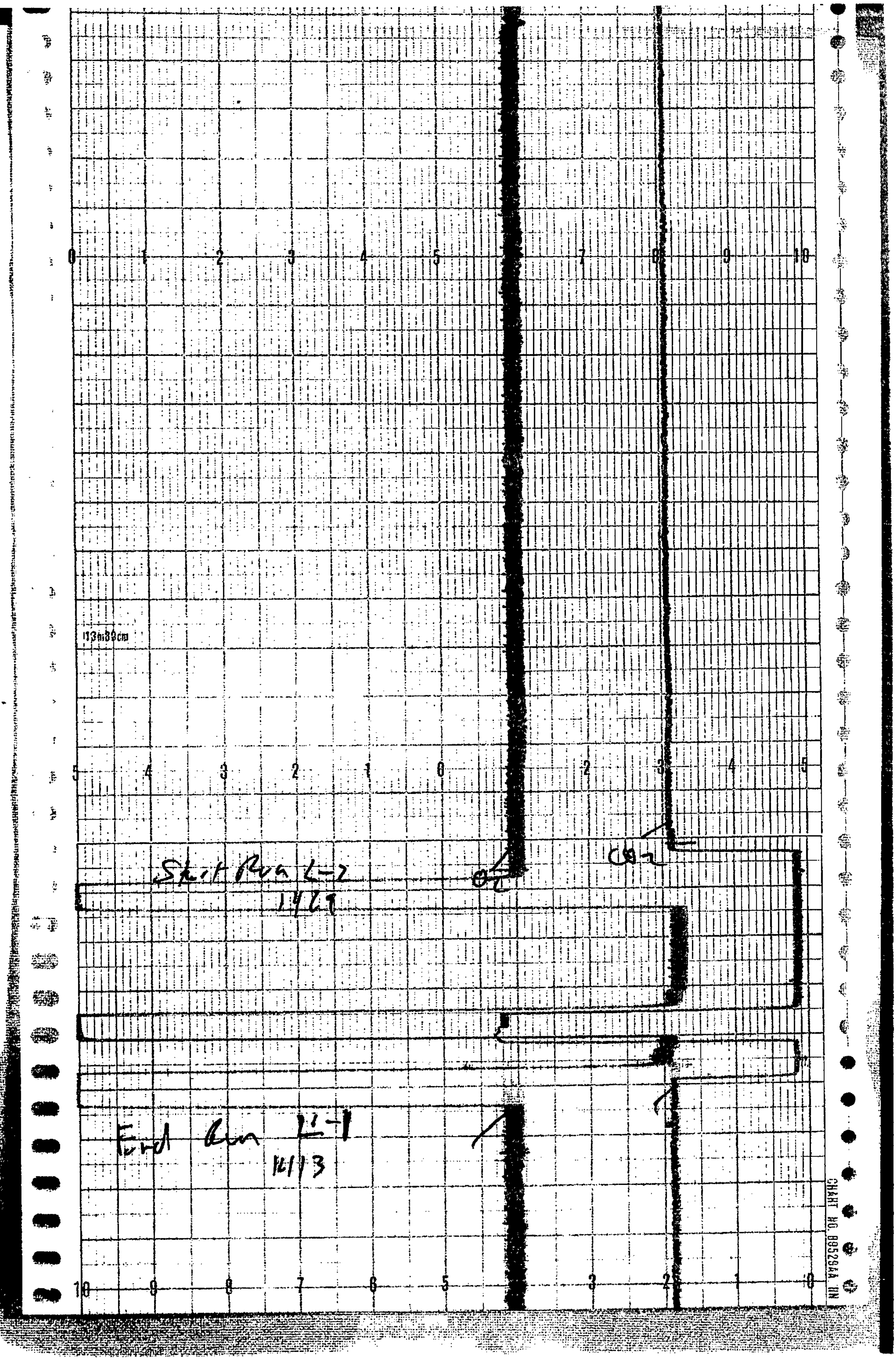
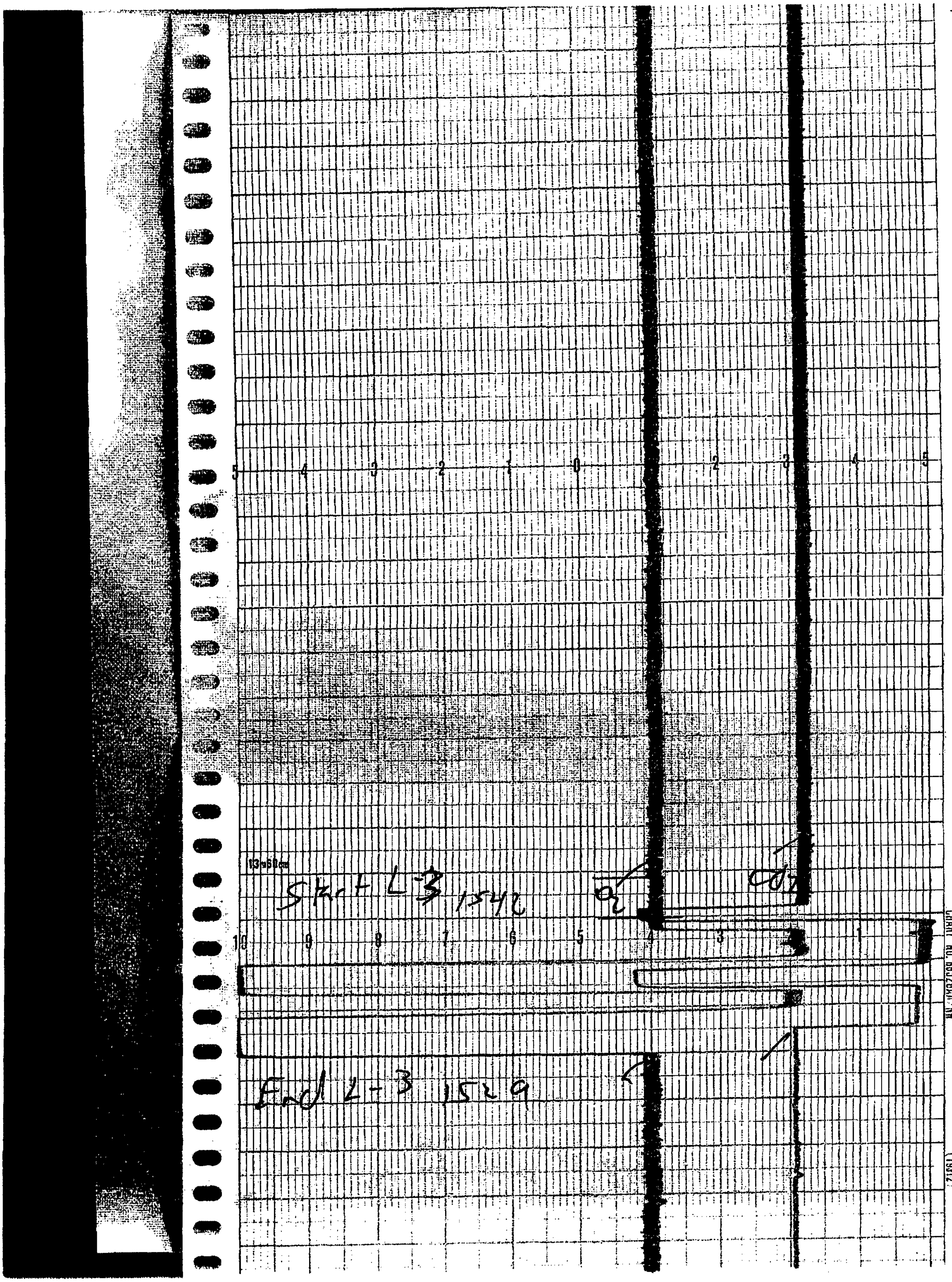


CHART NO. B05294A
Start
O2
CO2
End Run


14m20cm
CHART NO. B9528AA
14m40cm
End Run 1W-3


14m
0 1 2 3 4 5 7 8 9 10
Start L-1
O2
CO2
5 4 3 2 1 0 2 3 4 5
14m20cm


Start Run L-2
1429
O_2
CO_2
End Run L-1
1413



5 4 3 2 1 0 1 2 3 4 5
13u50cm
Start L-3 1542
10 9 8 7 6 5 4 3 2 1
End L-3 1529
CHART NO. BB520AA-NH
(19312)

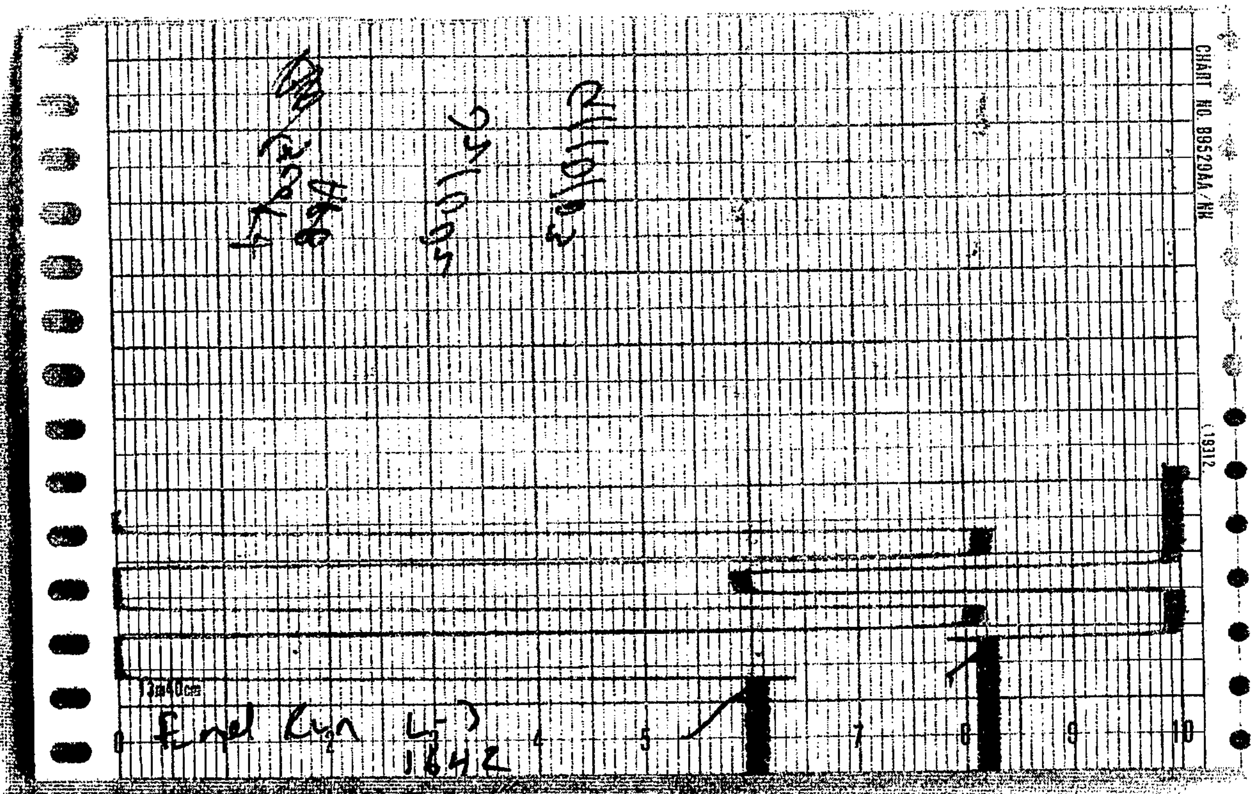


CHART NO. B9520AA/NK

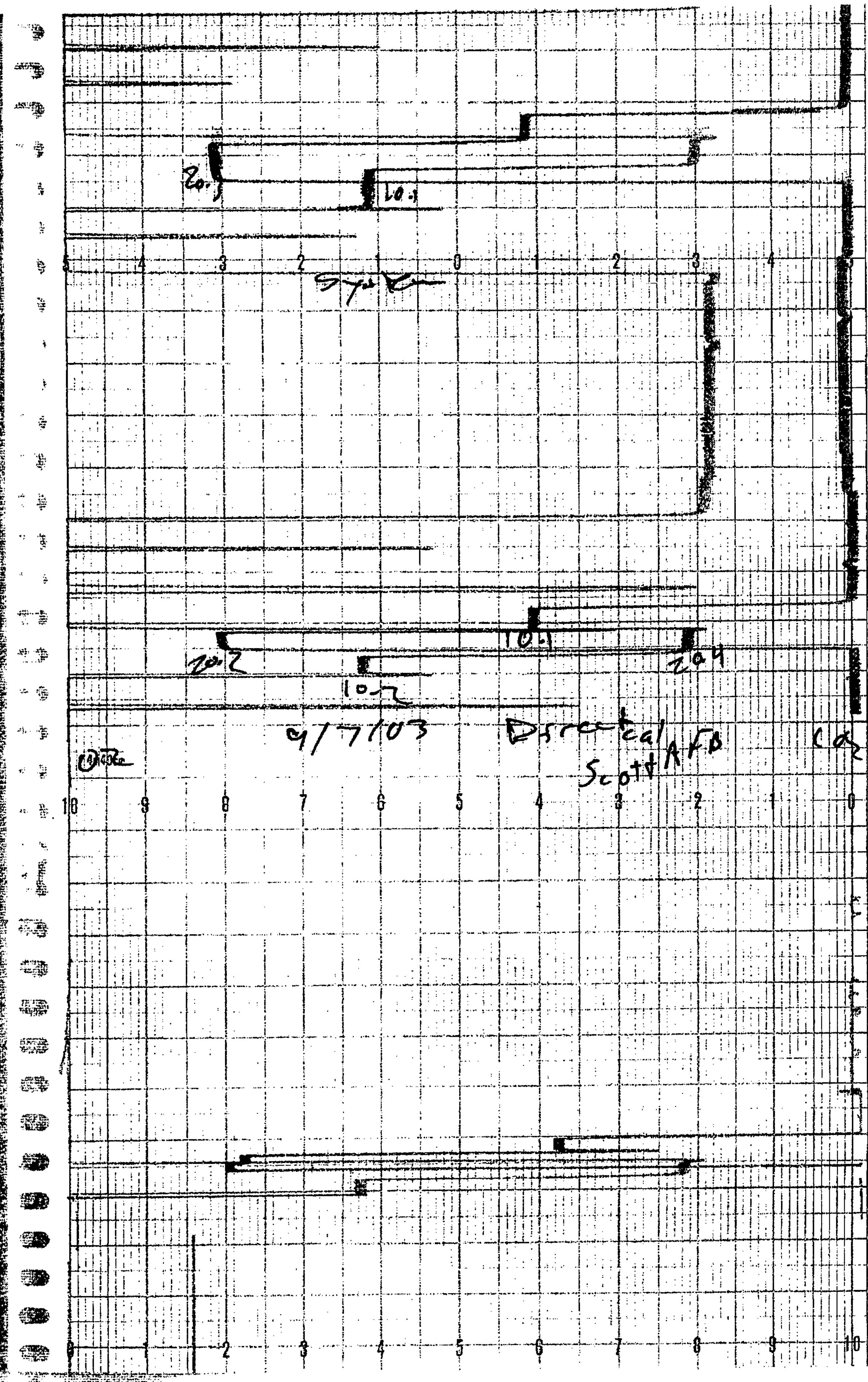
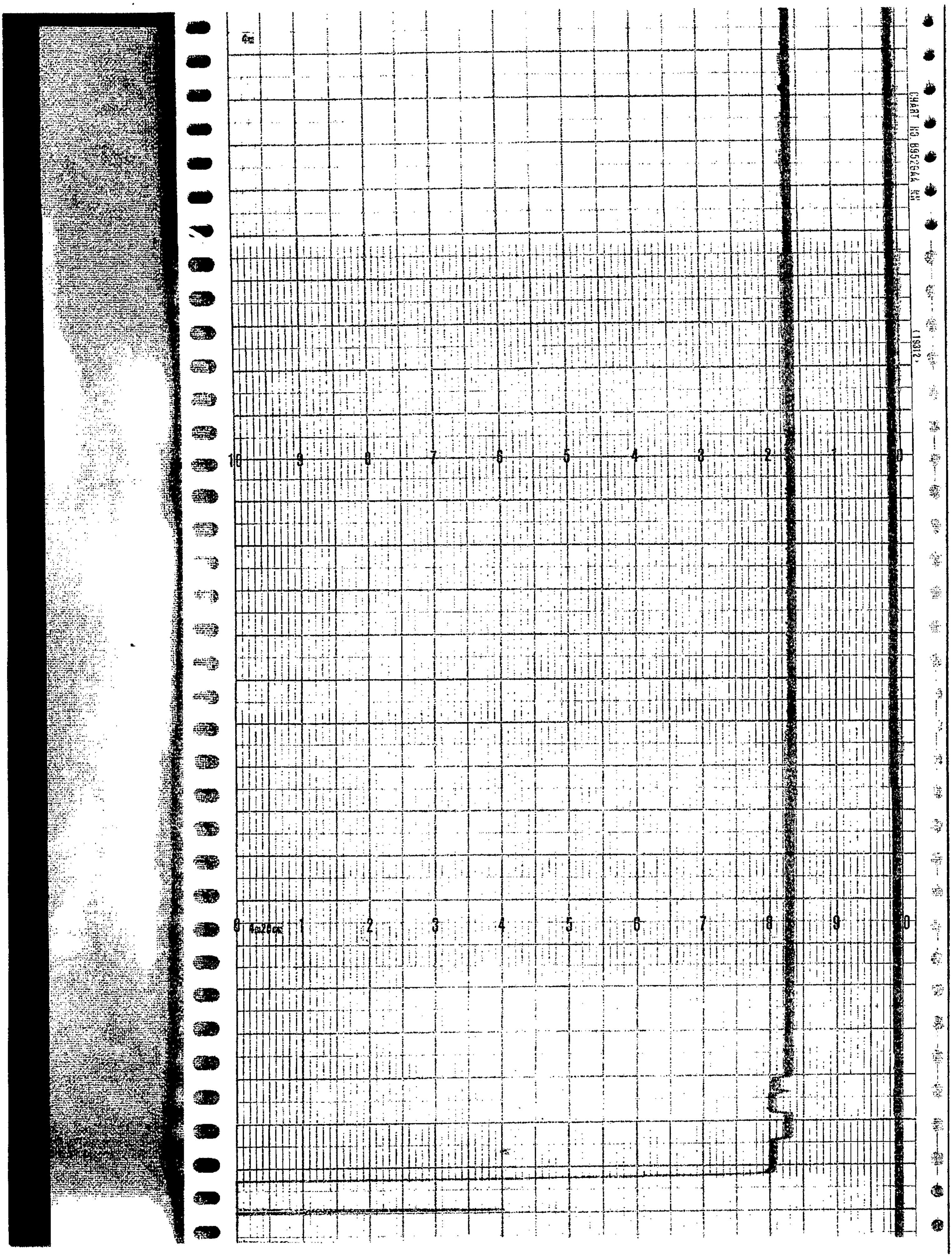
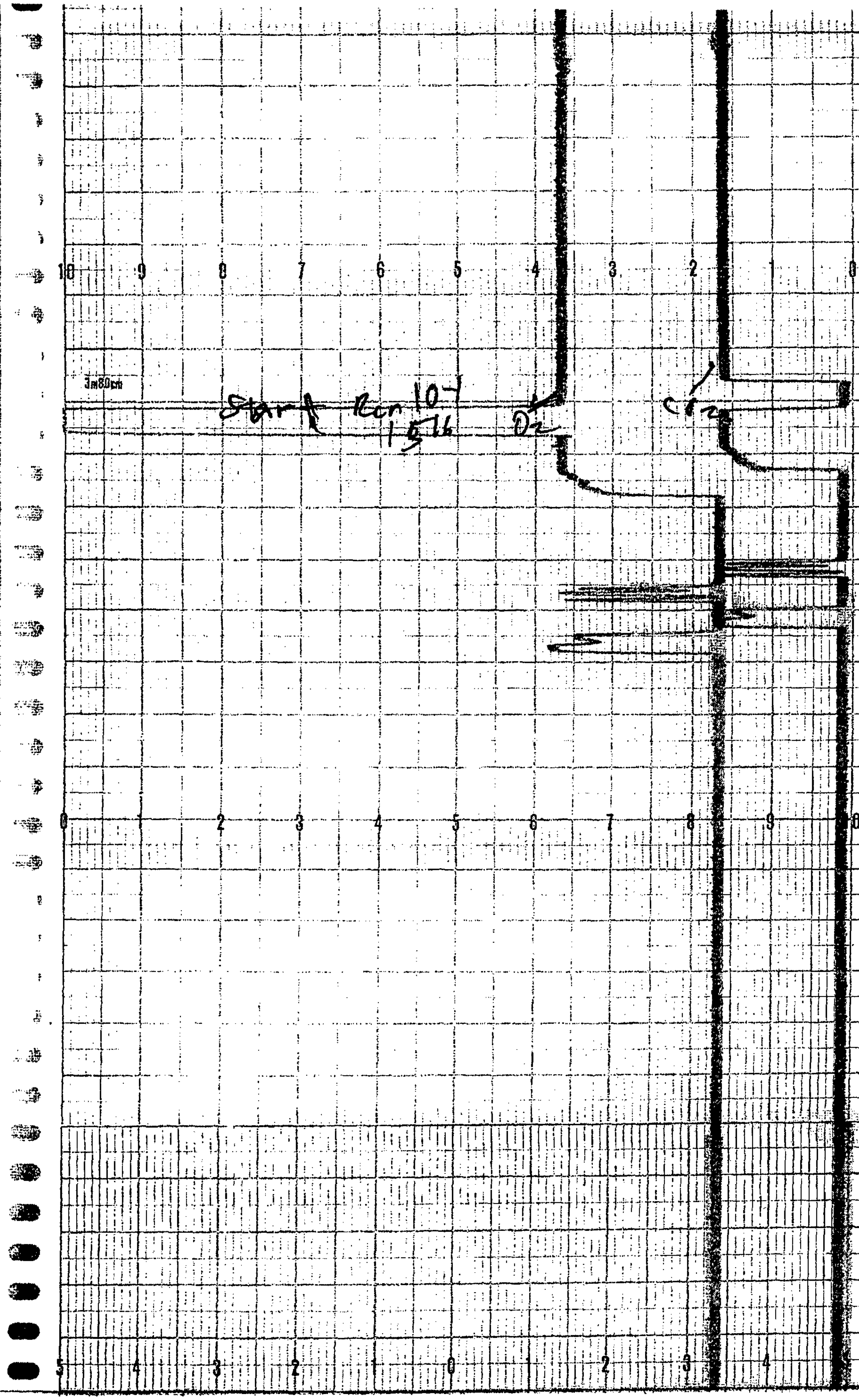
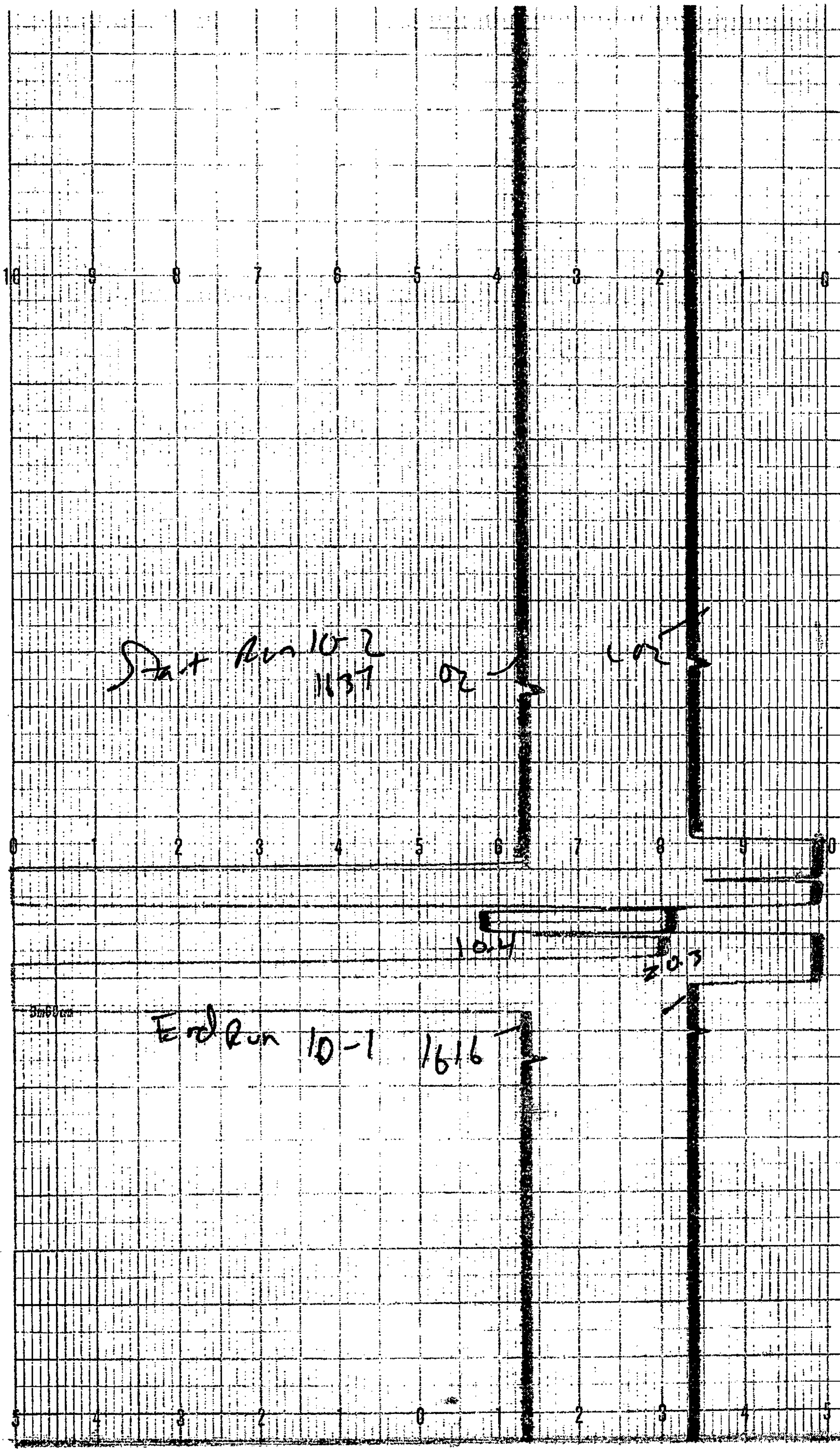


CHART NO. B9528AA/HH
20.1
10.1
20.2
10.2
20.4
9/7/03
Scott AFB





10 9 8 7 6 5 4 3 2 1 0
3m80cm
Start Run 10-1
1536
O2
Cl2
0 1 2 3 4 5 6 7 8 9 10
5 4 3 2 1 0 1 2 3 4


Start Run 10-2
1137
O2
CO2
10.4
20.3
End Run 10-1
1616

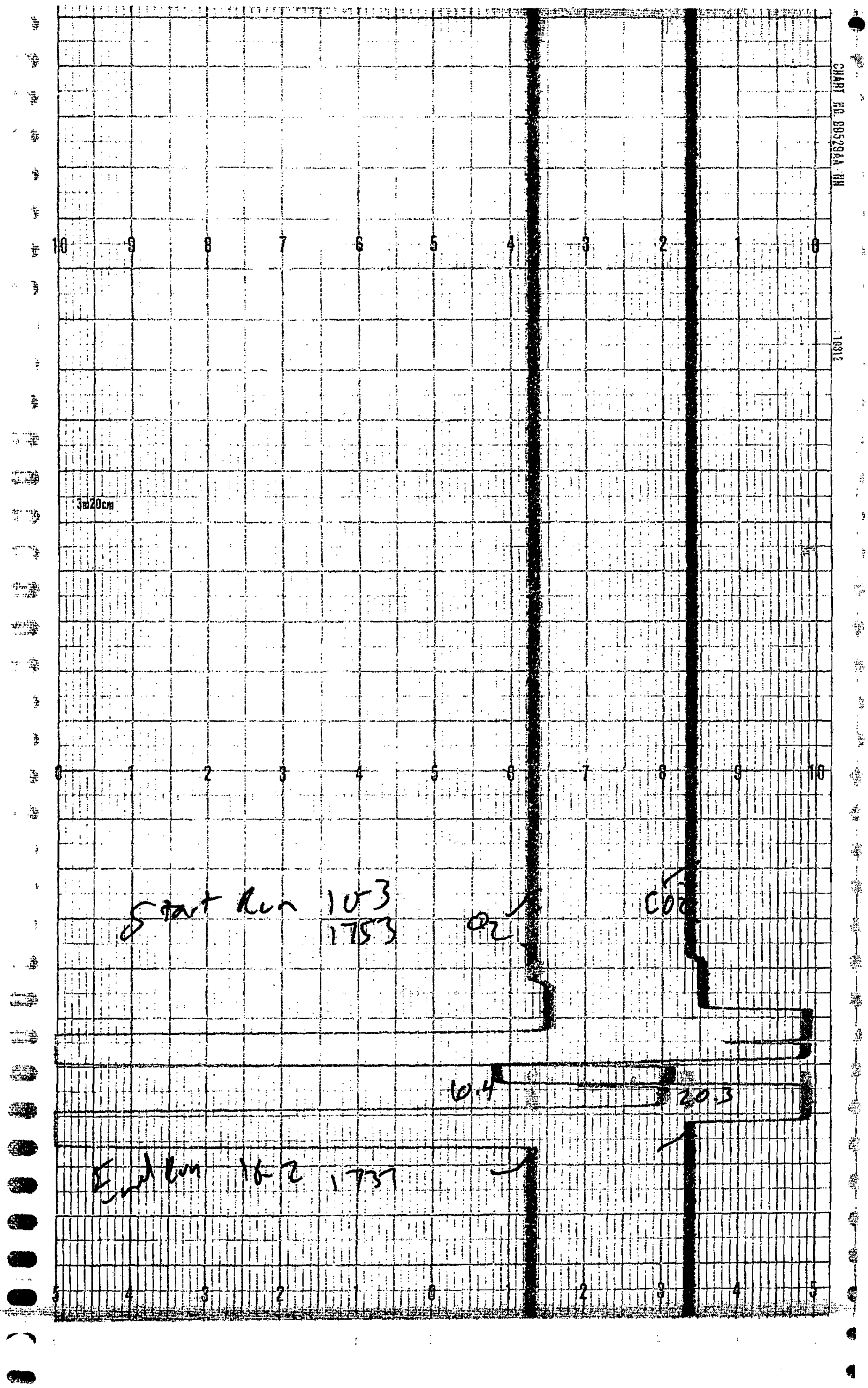
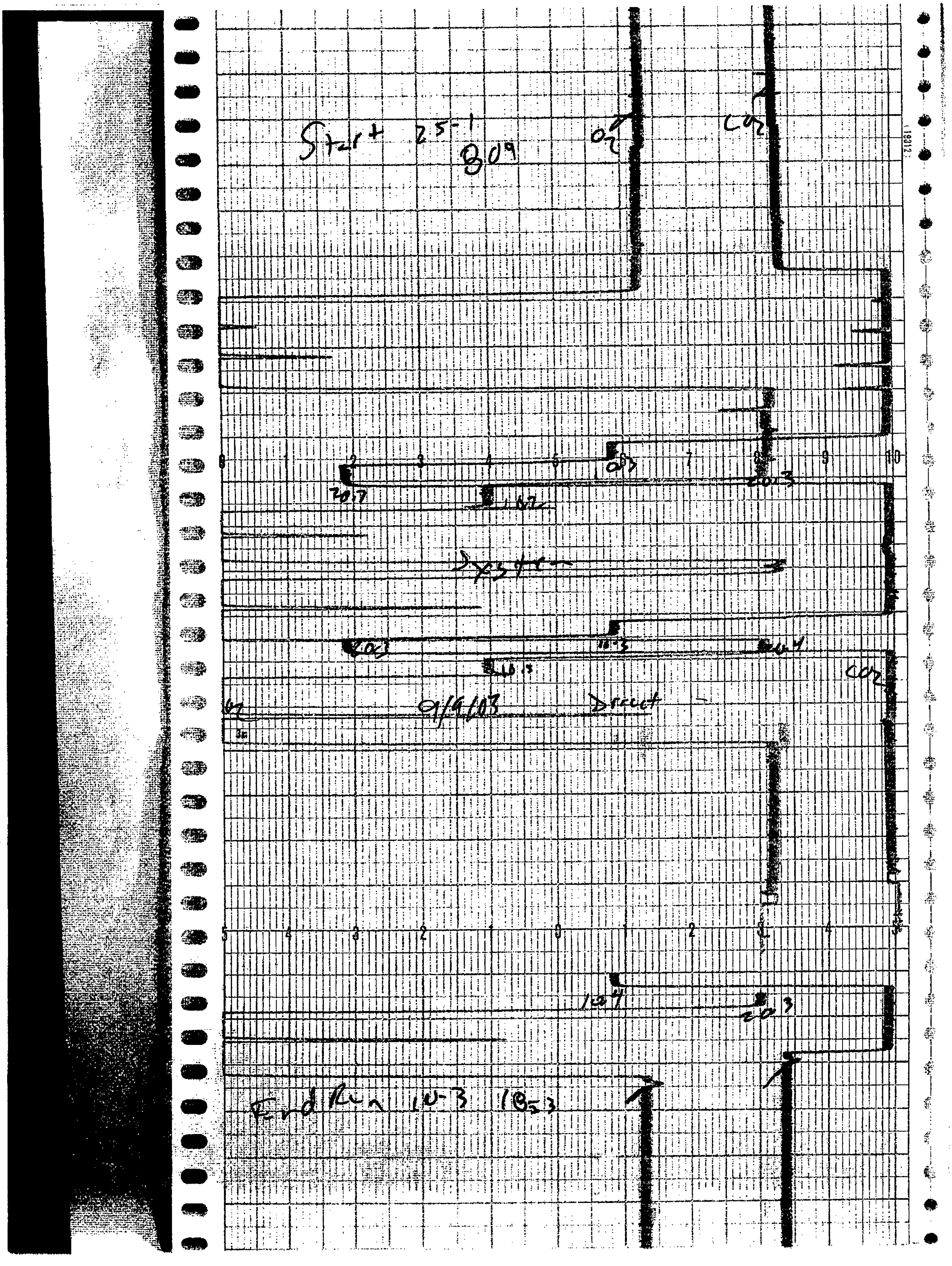
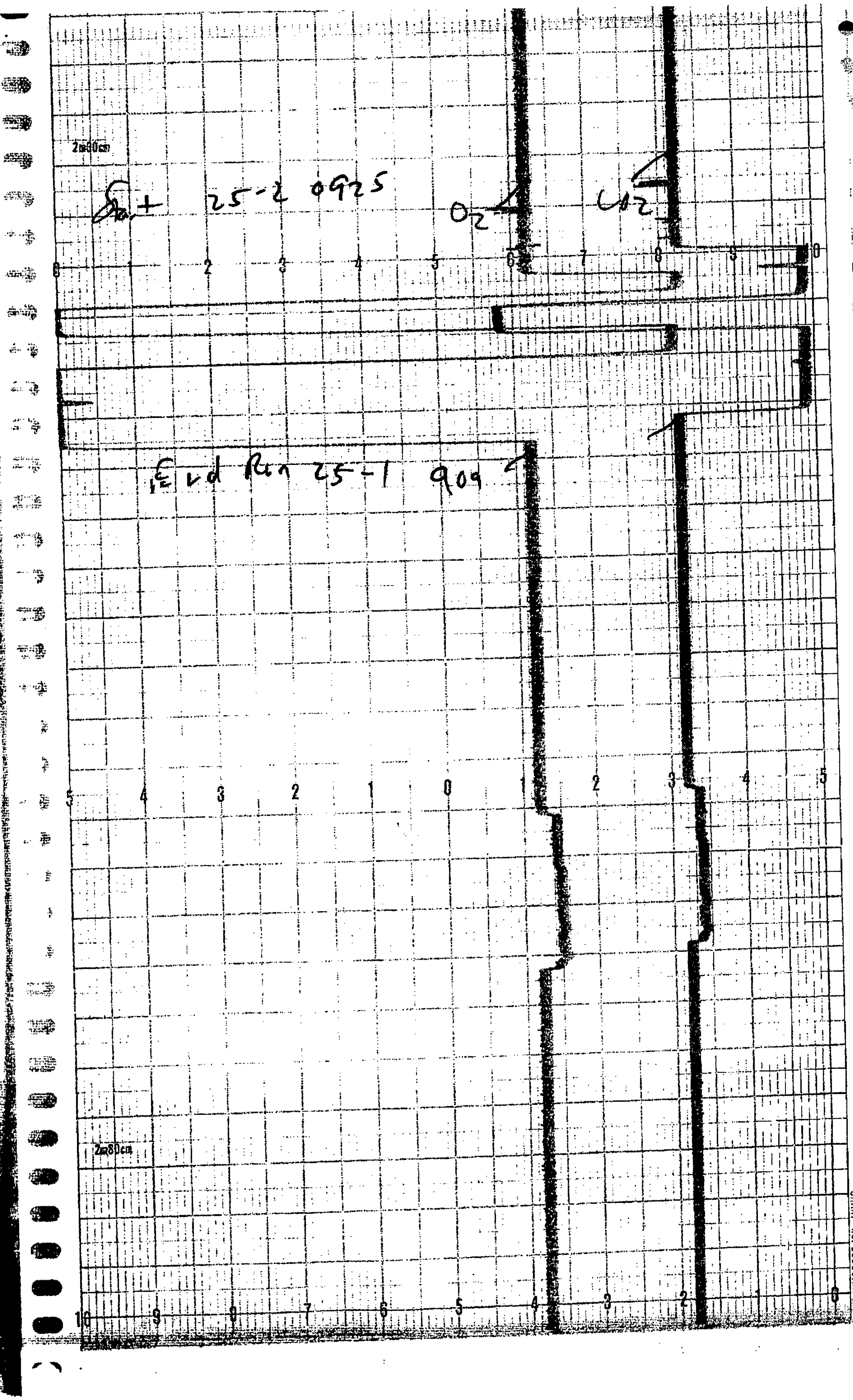
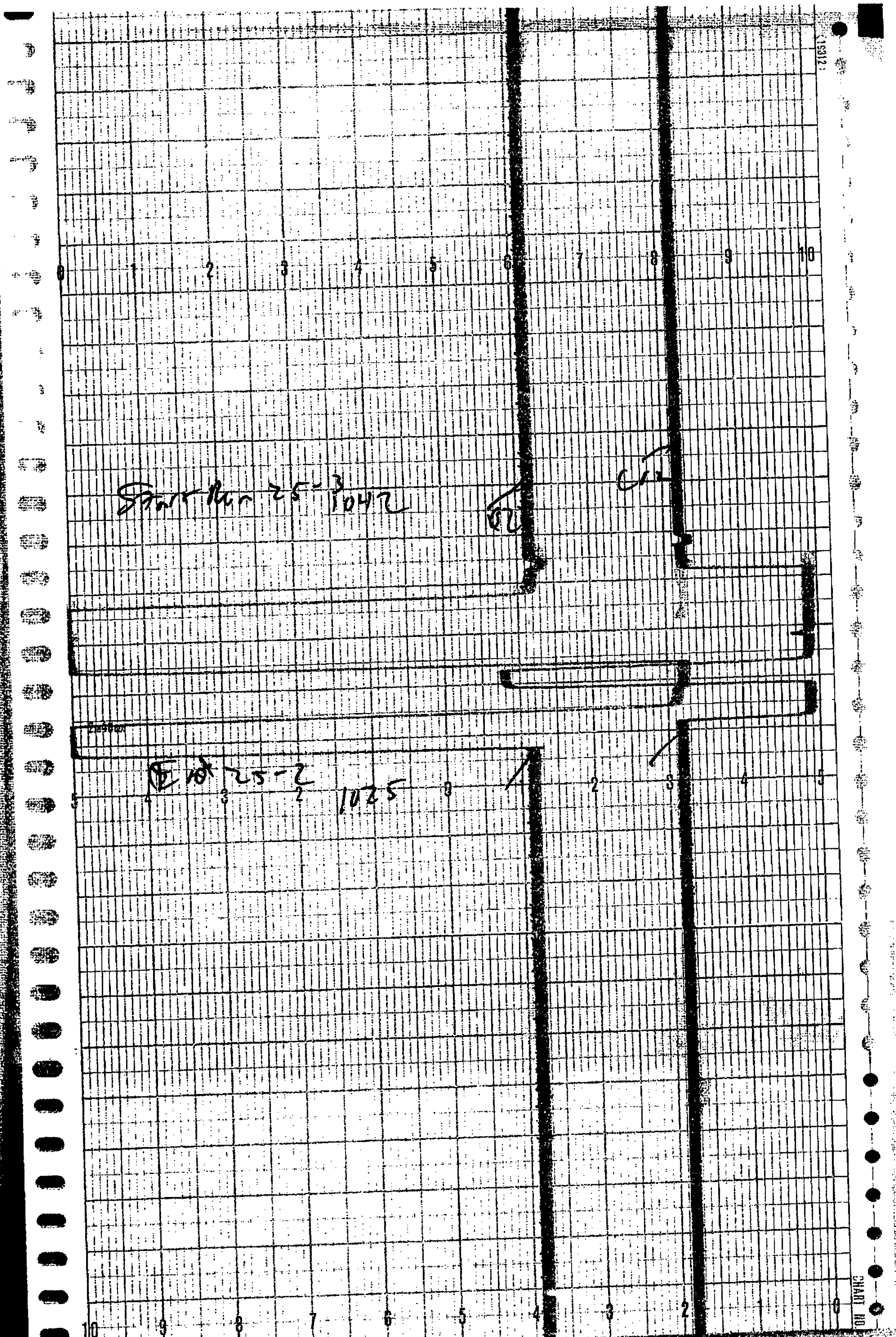


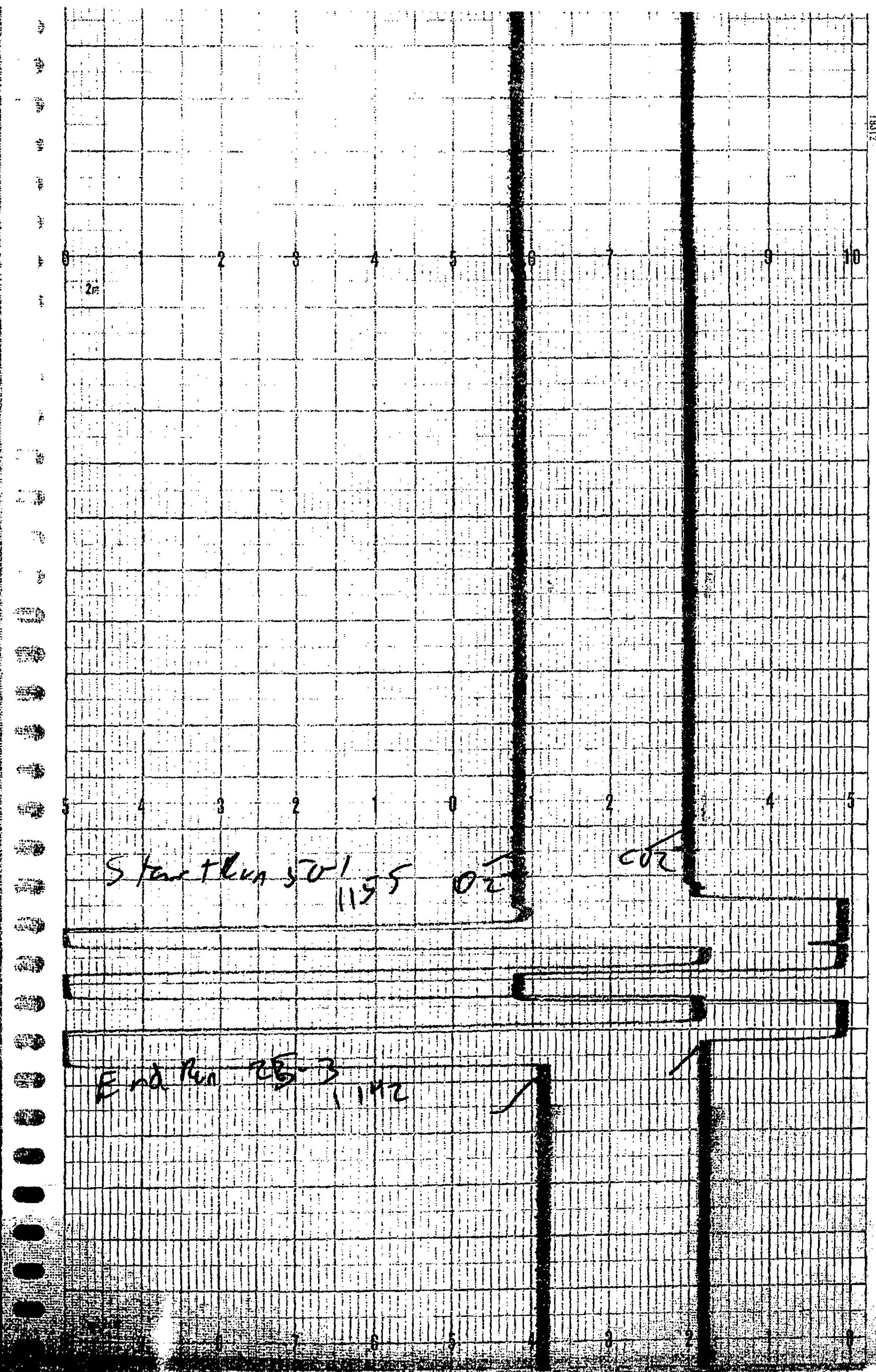
CHART NO. 805296AA
3m20cm
Start Run 103
1753
O2
CO2
10.4
20.3
End Run 102 1737


Start 25-1
809
O_2
CO_2
0 1 2 3 4 5 6 7 8 9 10
20.7
20.3
20.3
System
20.3
10.3
CO_2
9/9/03
Direct
5 4 3 2 1 0 1 2 3 4 5
10.4
20.3
End Run 10-3 1853

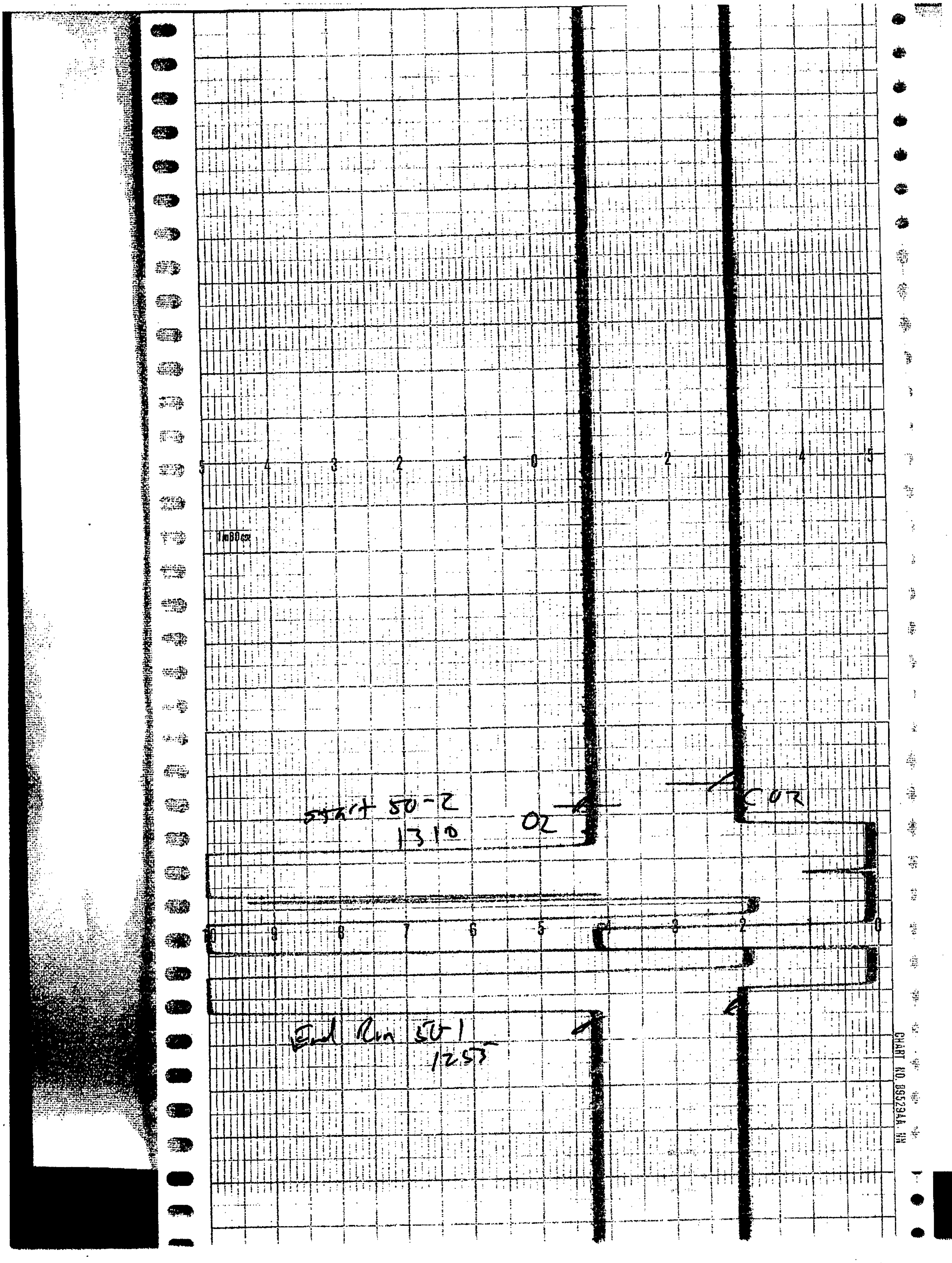


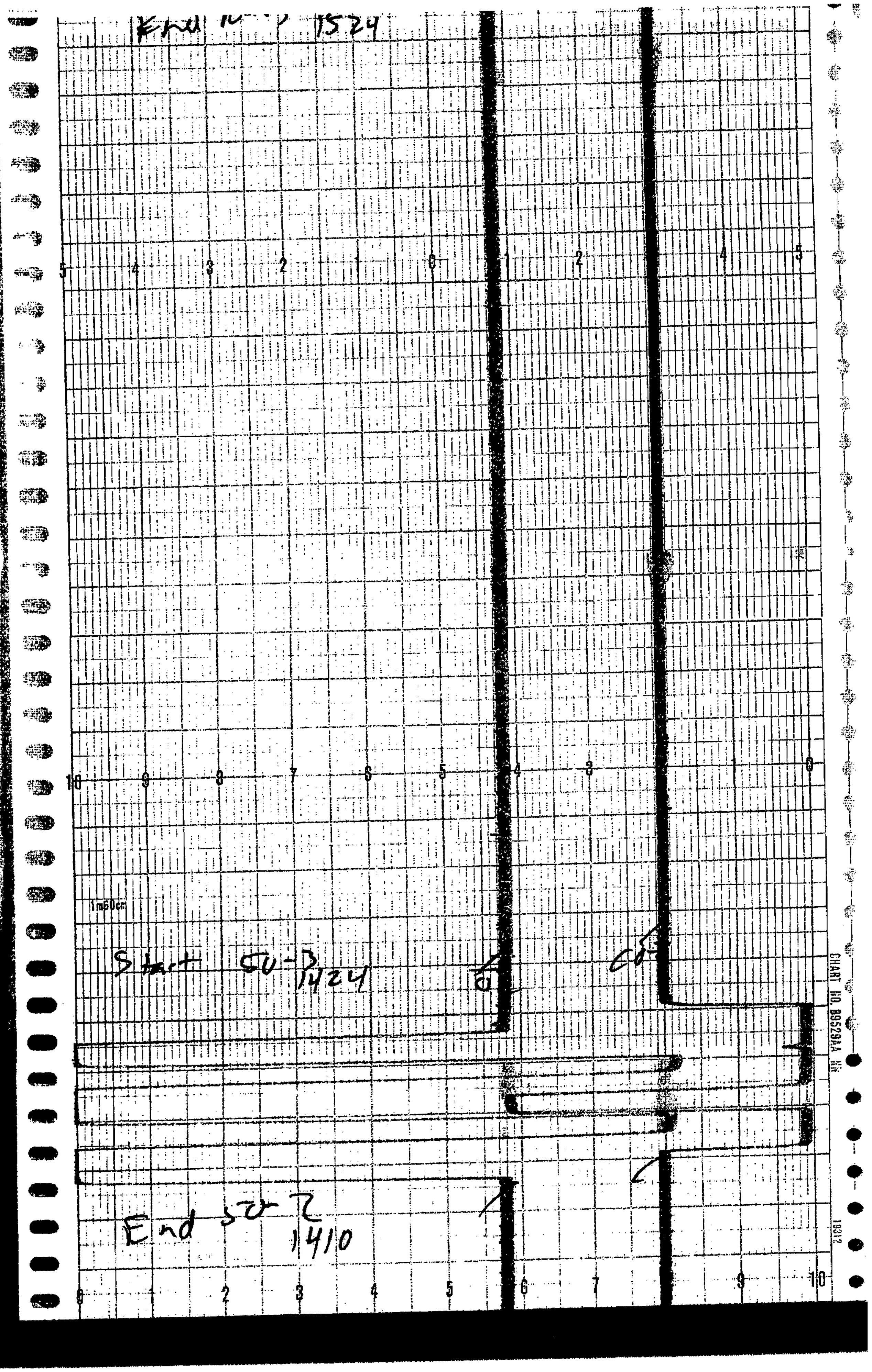
2m80cm
Start 25-2 0925
O_2
CO_2
0 1 2 3 4 5 6 7 8 9 10
End Run 25-1 909
5 4 3 2 1 0 1 2 3 4 5
2m80cm
10 9 8 7 6 5 4 3 2 1 0
CHART NO. B9529AA/NN

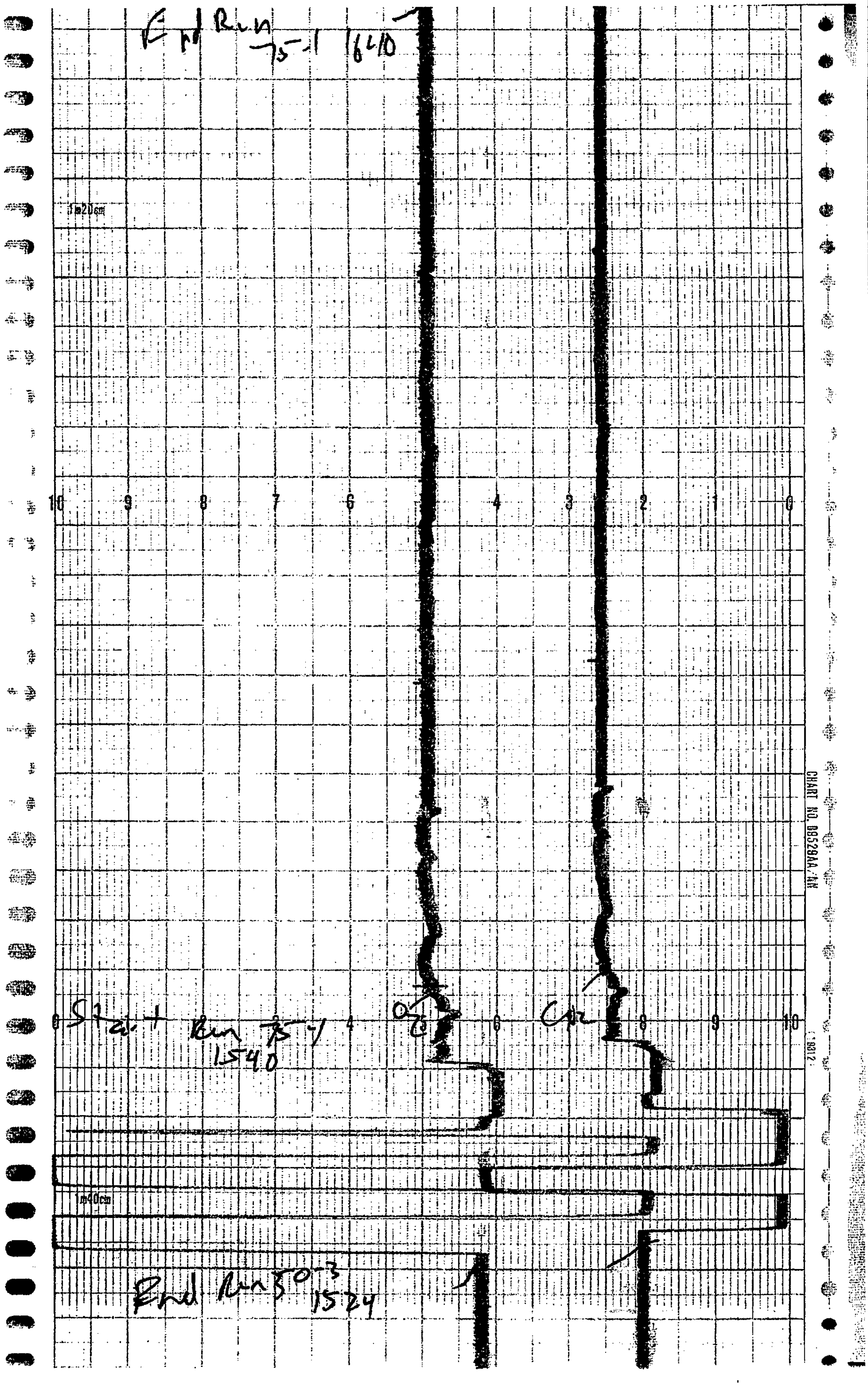

Start Run 25-3 1042
End 25-2 1025
CHART NO.



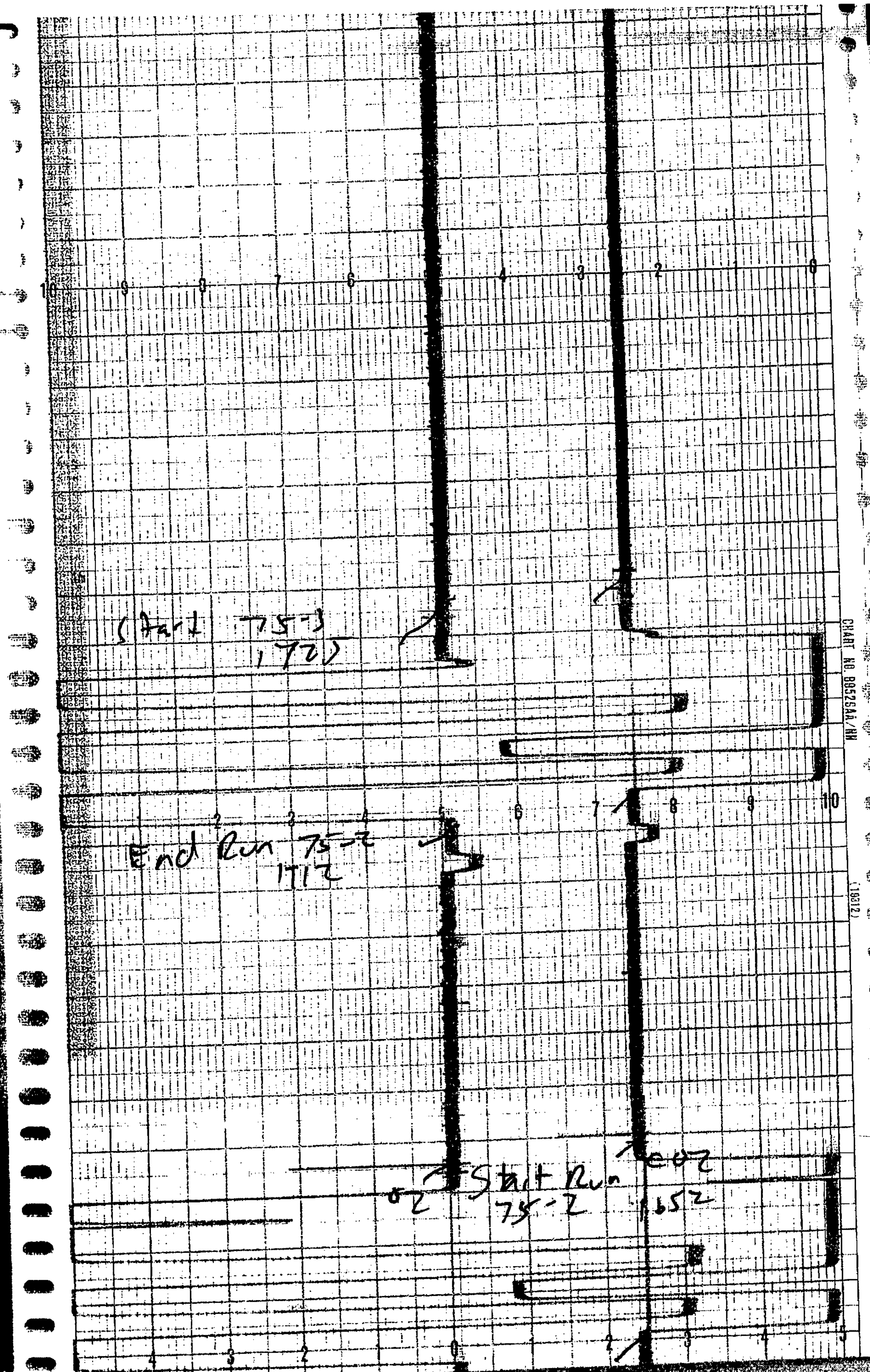
Start Run 50-1
1155
O2
CO2
End Run 25-3
1142

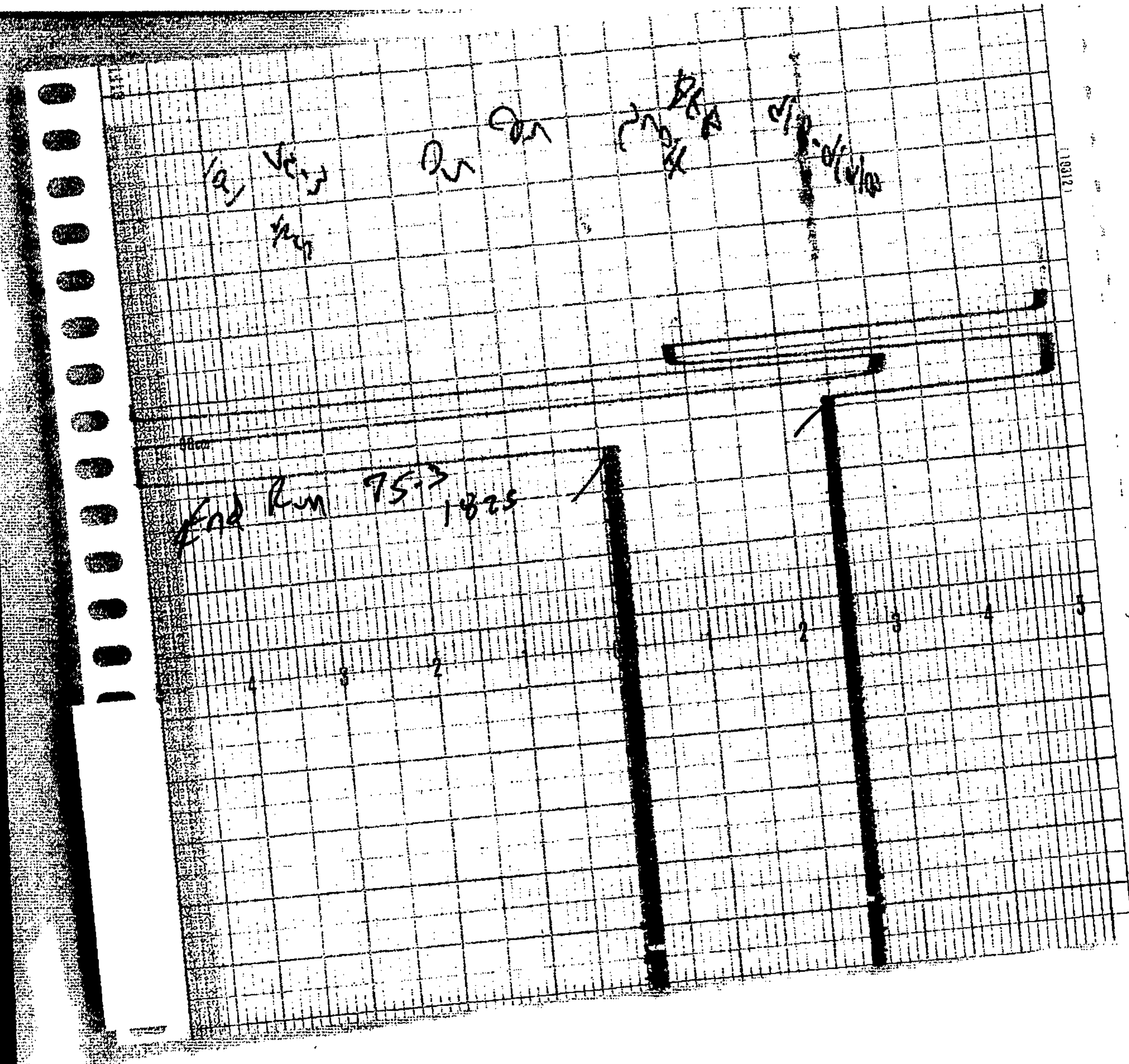

Start 50-2
1310
O2
CO2
End Run 50-1
1255
CHART NO. B9529AA

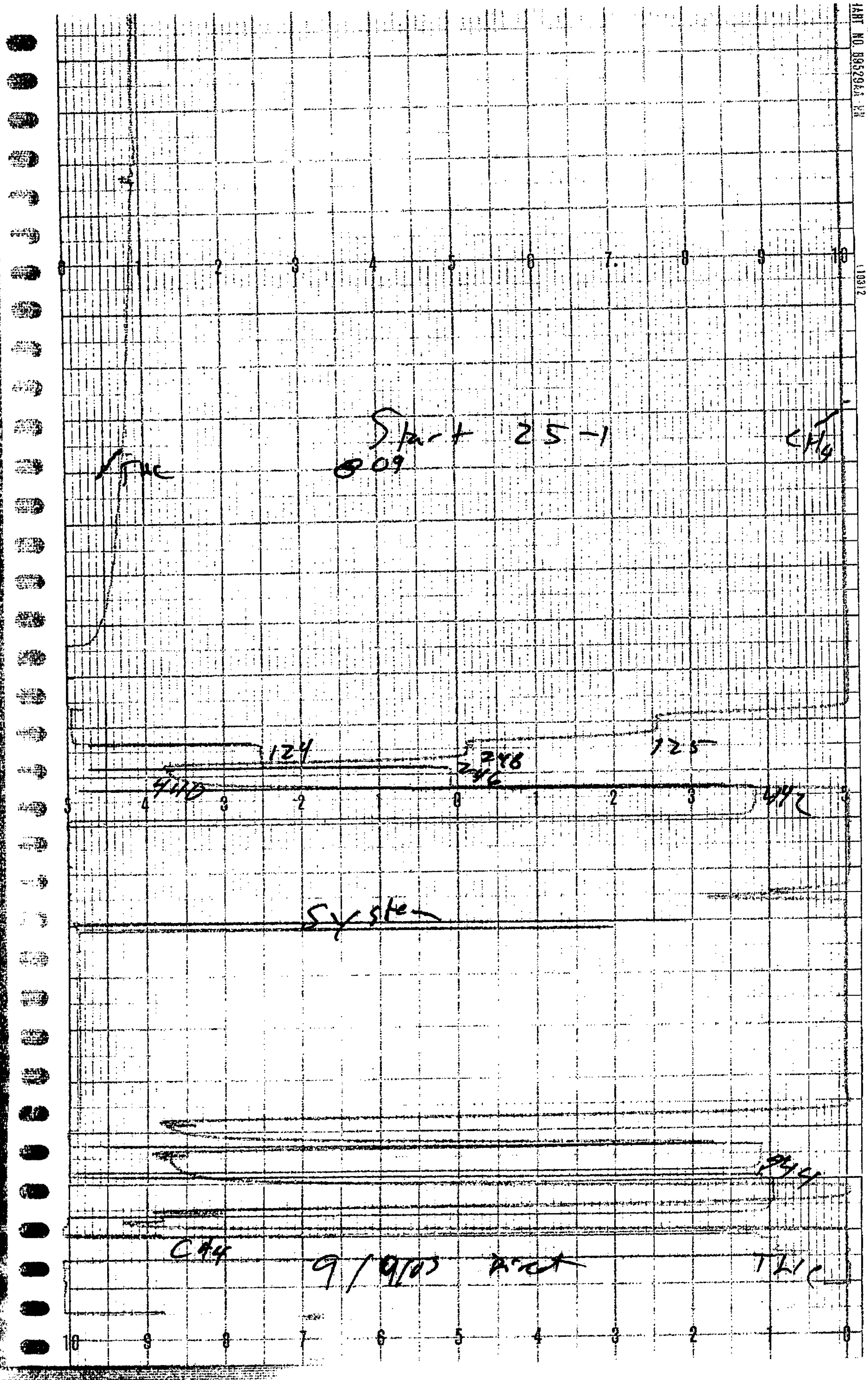

End
1524
1m60cm
Start SU-3
1424
CO
End SU-2
1410
CHART NO. B9529AA NR
19312

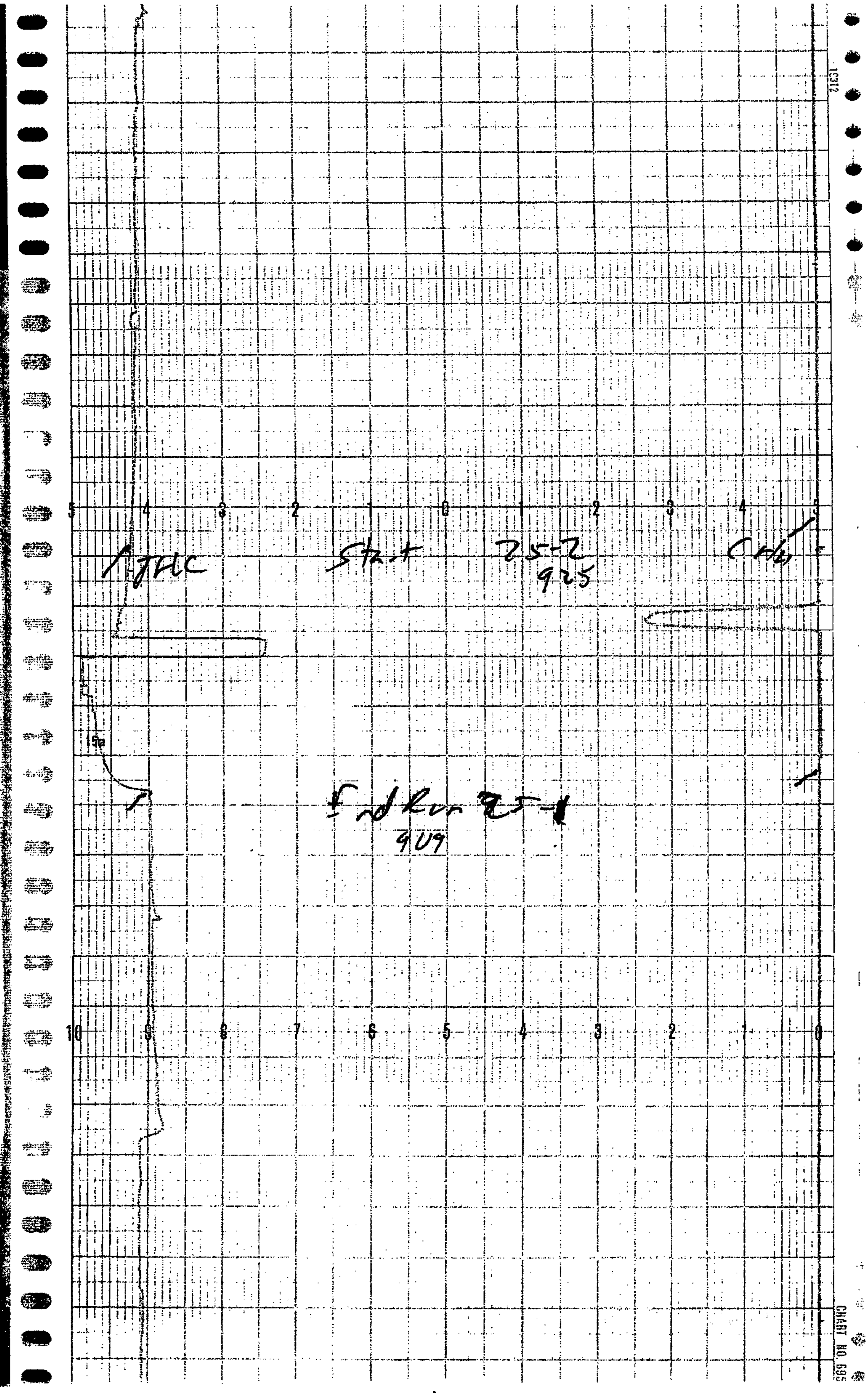


End Run 75-1 1610
1m20cm
10 9 8 7 6 5 4 3 2 1 0
Start Run 75-1 1540
O2
CO2
1m40cm
End Run 50-3 1524
CHART NO. 00529AA/AN


Start 75-3
1725
End Run 75-2
1712
Start Run
75-2
1652
CHART NO. B6525AA/NN


End Run 75-3
1825


Start 25-1
@09
CH4
124
248
246
125
442
System
844
C44
9/9/03



THC
Start 25-2
925
CH4
End Run 25-1
909
CHART NO. 695

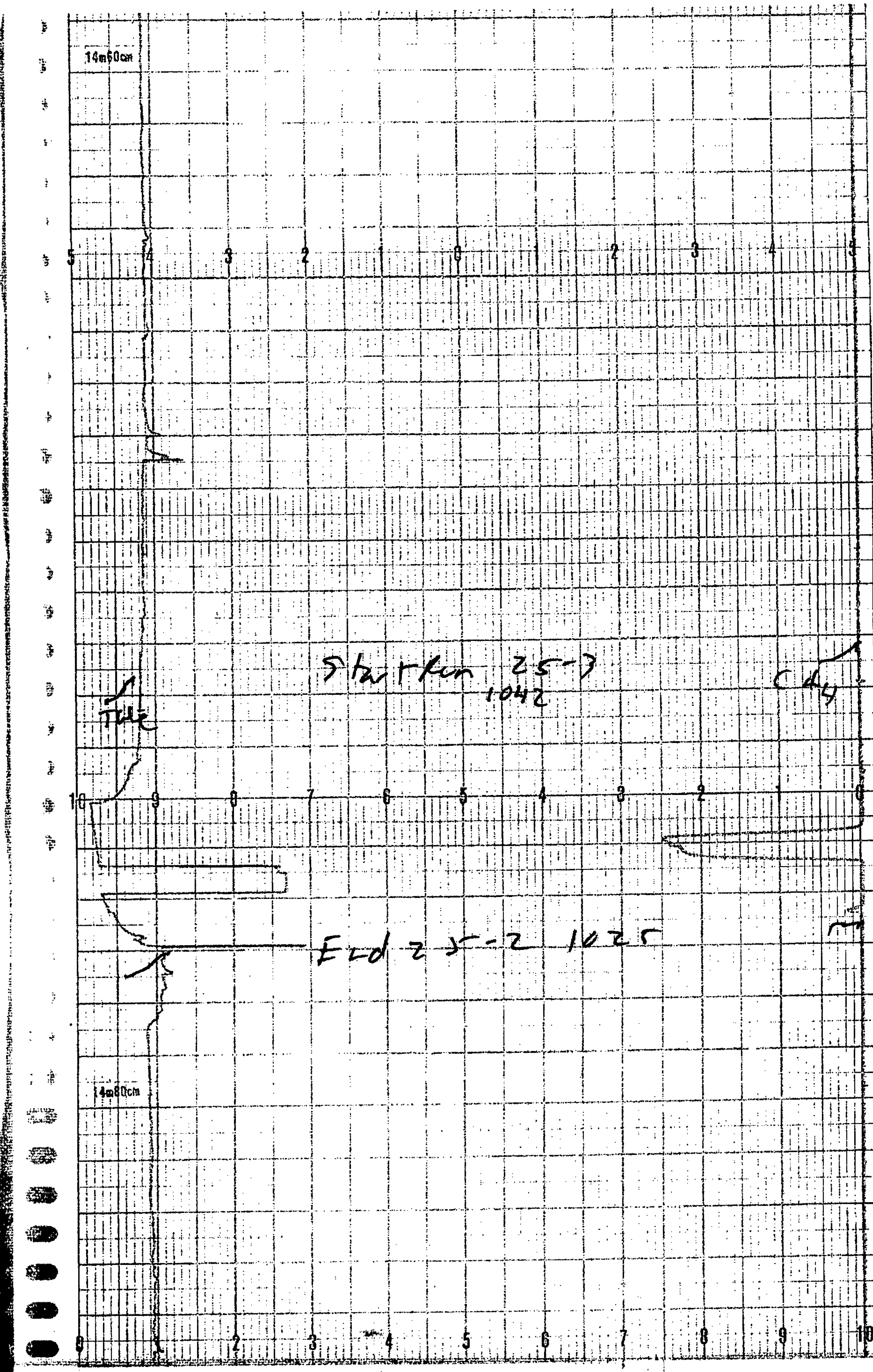
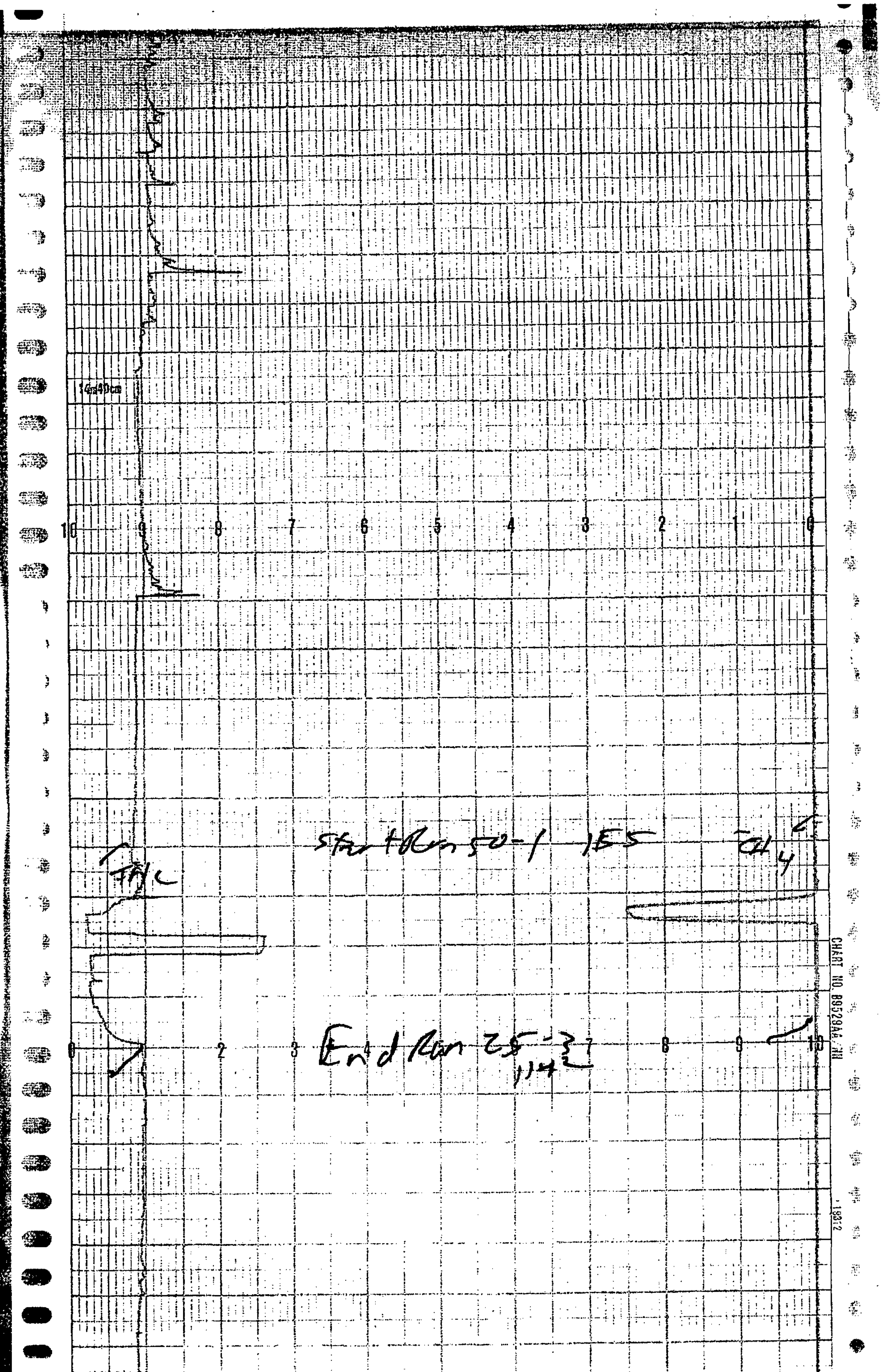
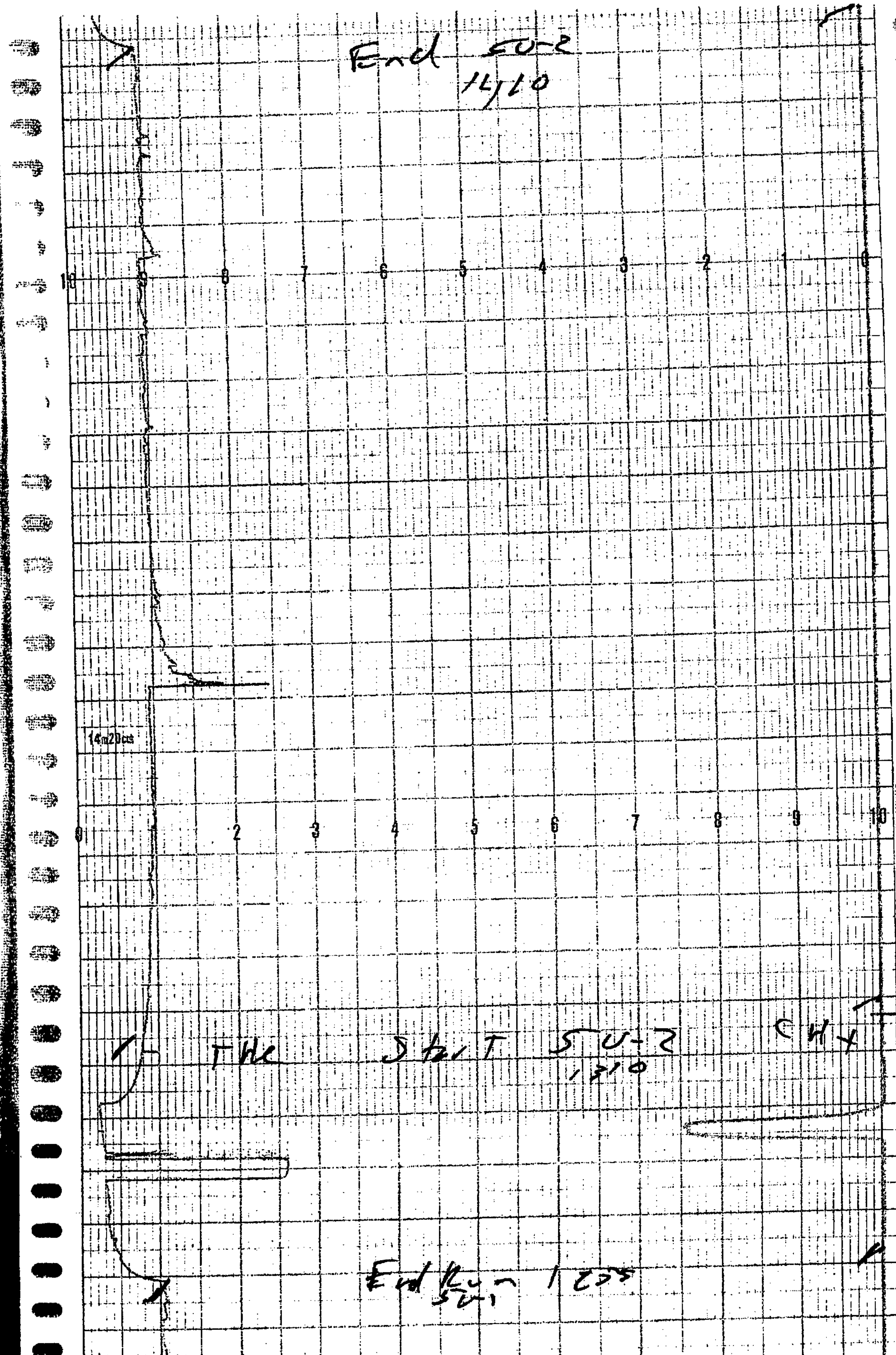
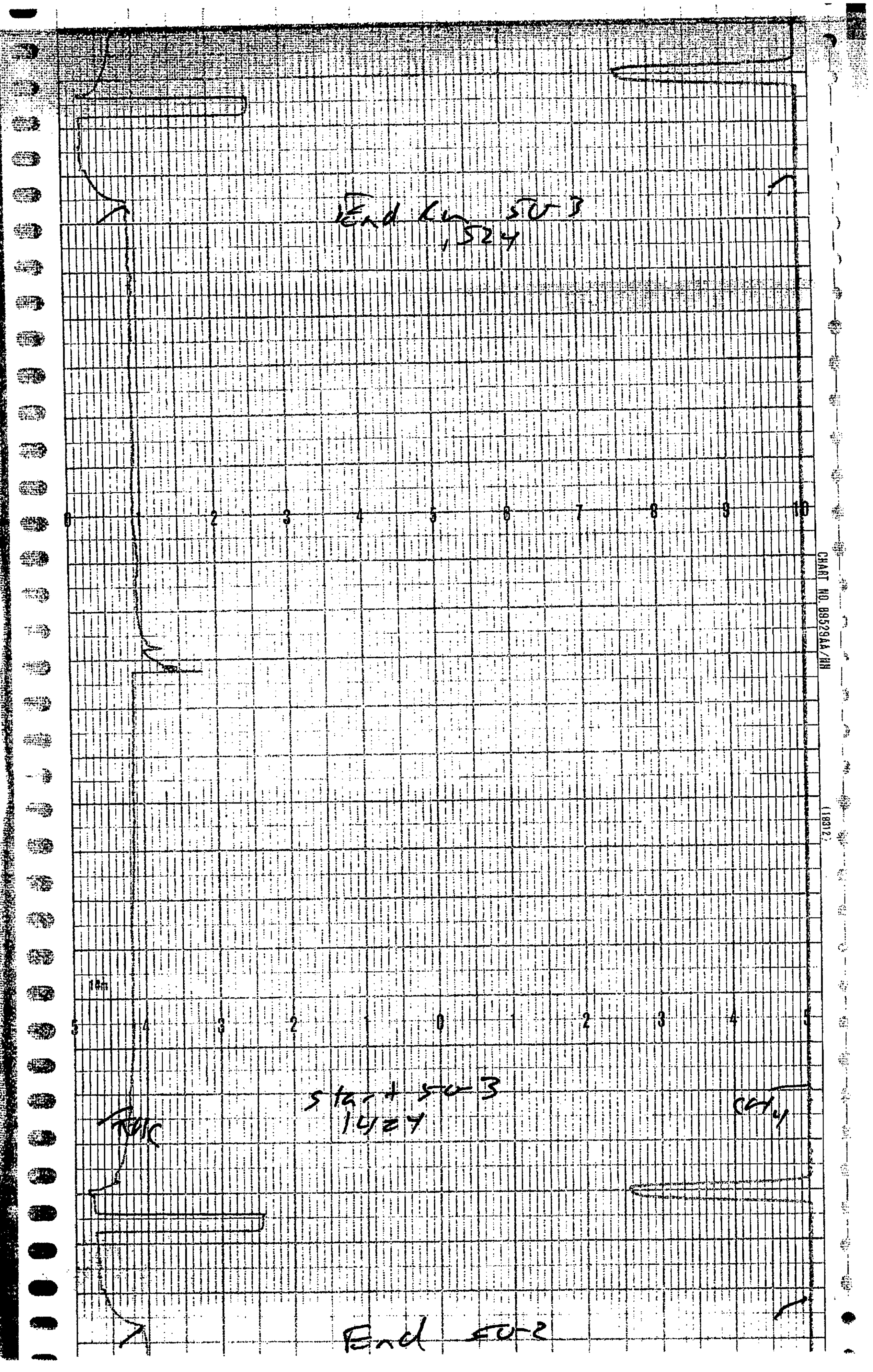


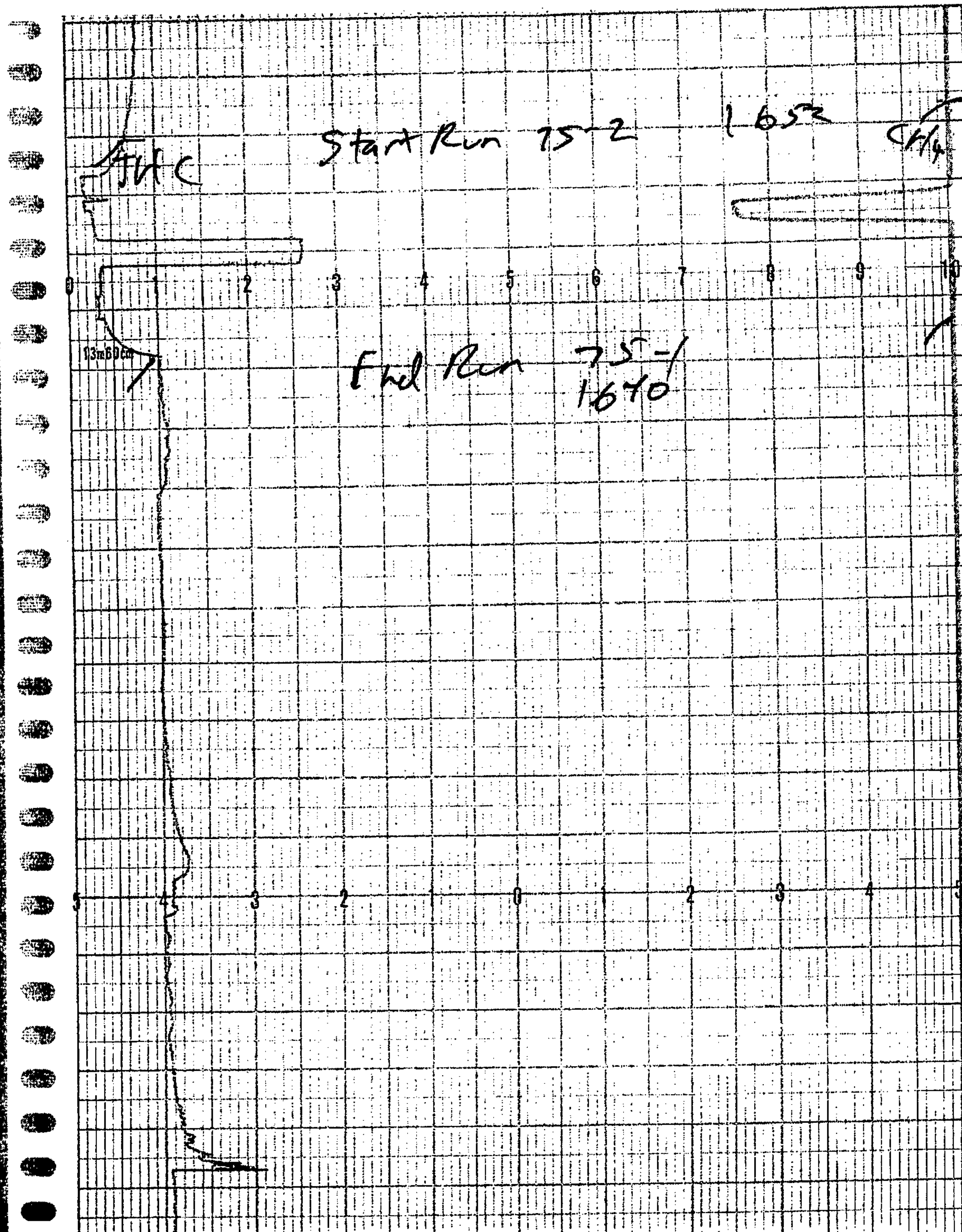
CHART NO. B9529AA/NN



10 9 8 7 6 5 4 3 2 1 0
Start Run 50-1 1E5
CH4
THC
End Run 25-3
CHART NO. B9529AA NH


End SU-2
1410
Start SU-2
1310
CH4
End Run 1235
SU-1


End Run 50-3
1524
0 1 2 3 4 5 6 7 8 9 10
CHART NO. B9529AA/HN
5 4 3 2 1 0 1 2 3 4 5
Start 50-3
1424
End 50-2


THC
Start Run T5-2
1652
CH4
End Run T5-1
1640
CHART NO. B0529AA NN
Start Run T5-1
1540
CH4
THC
13m60cm

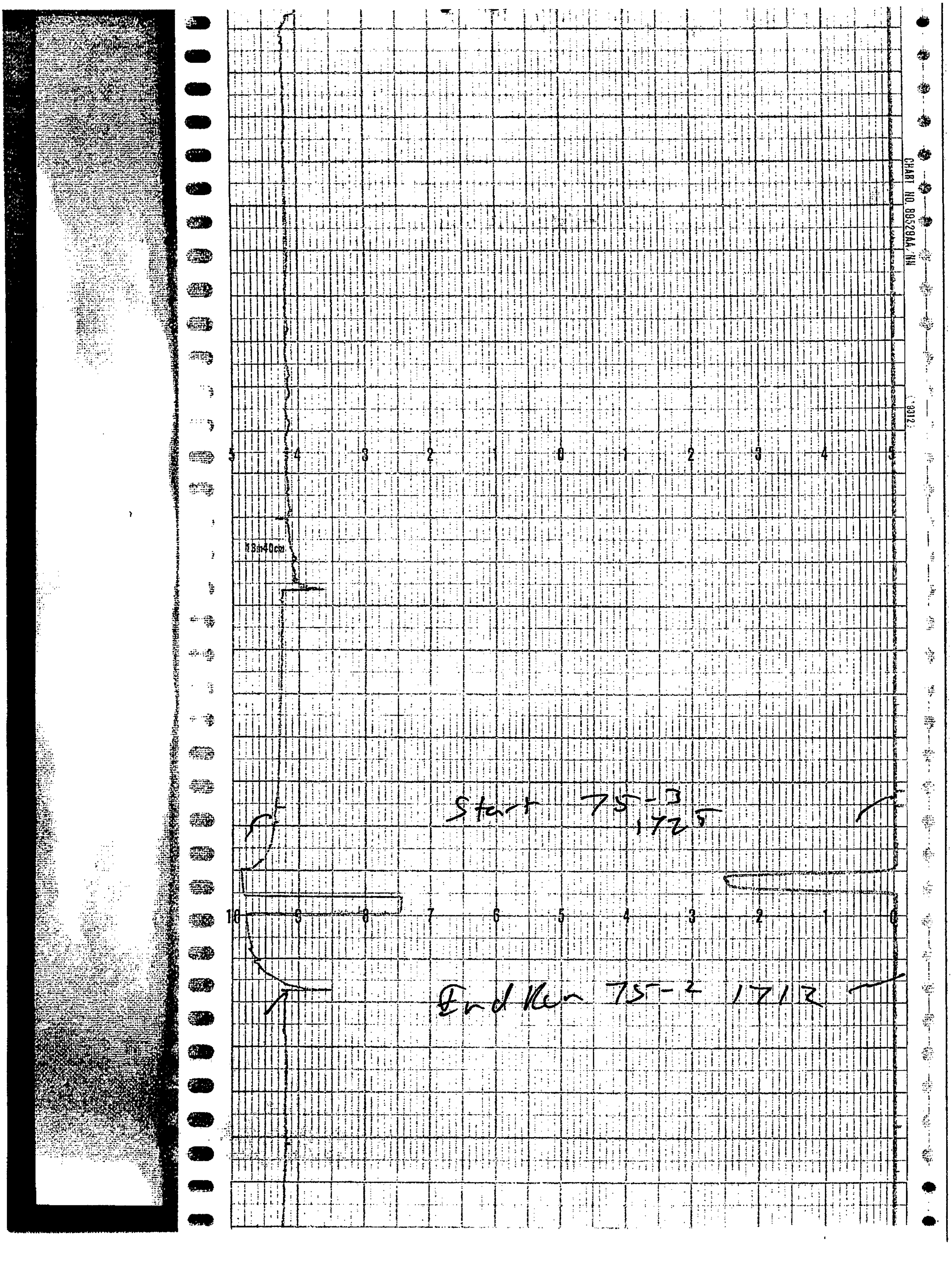
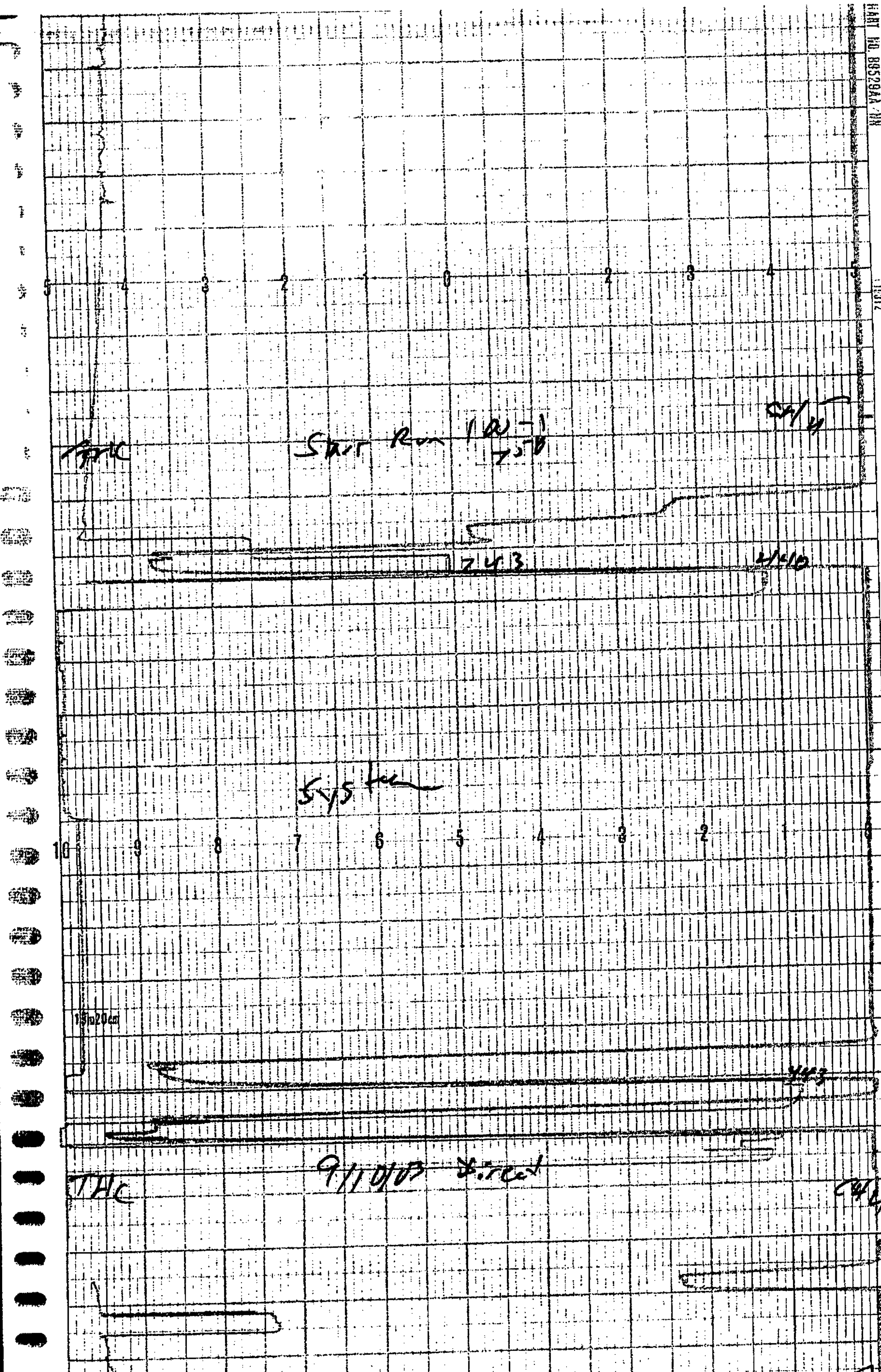
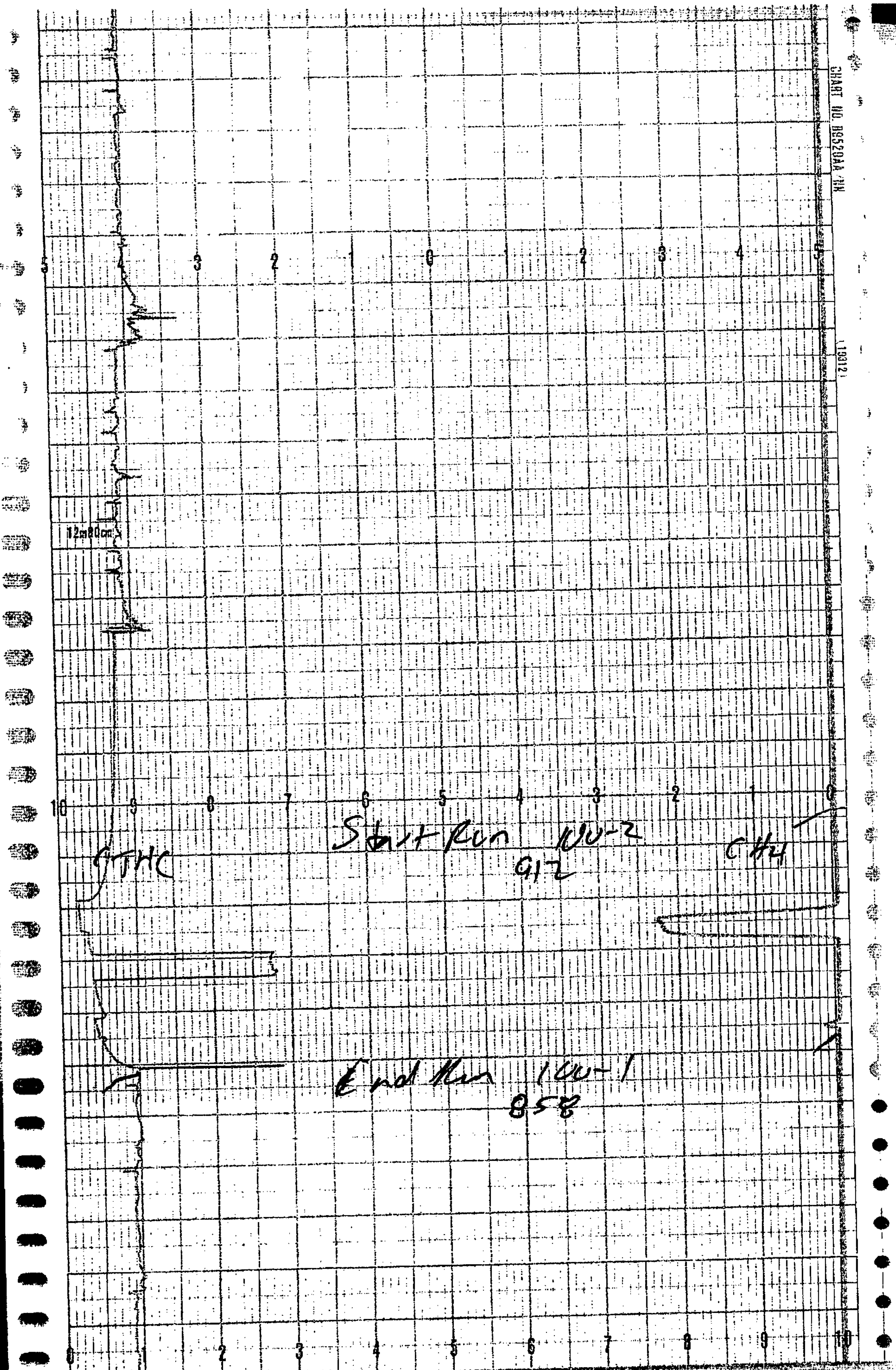
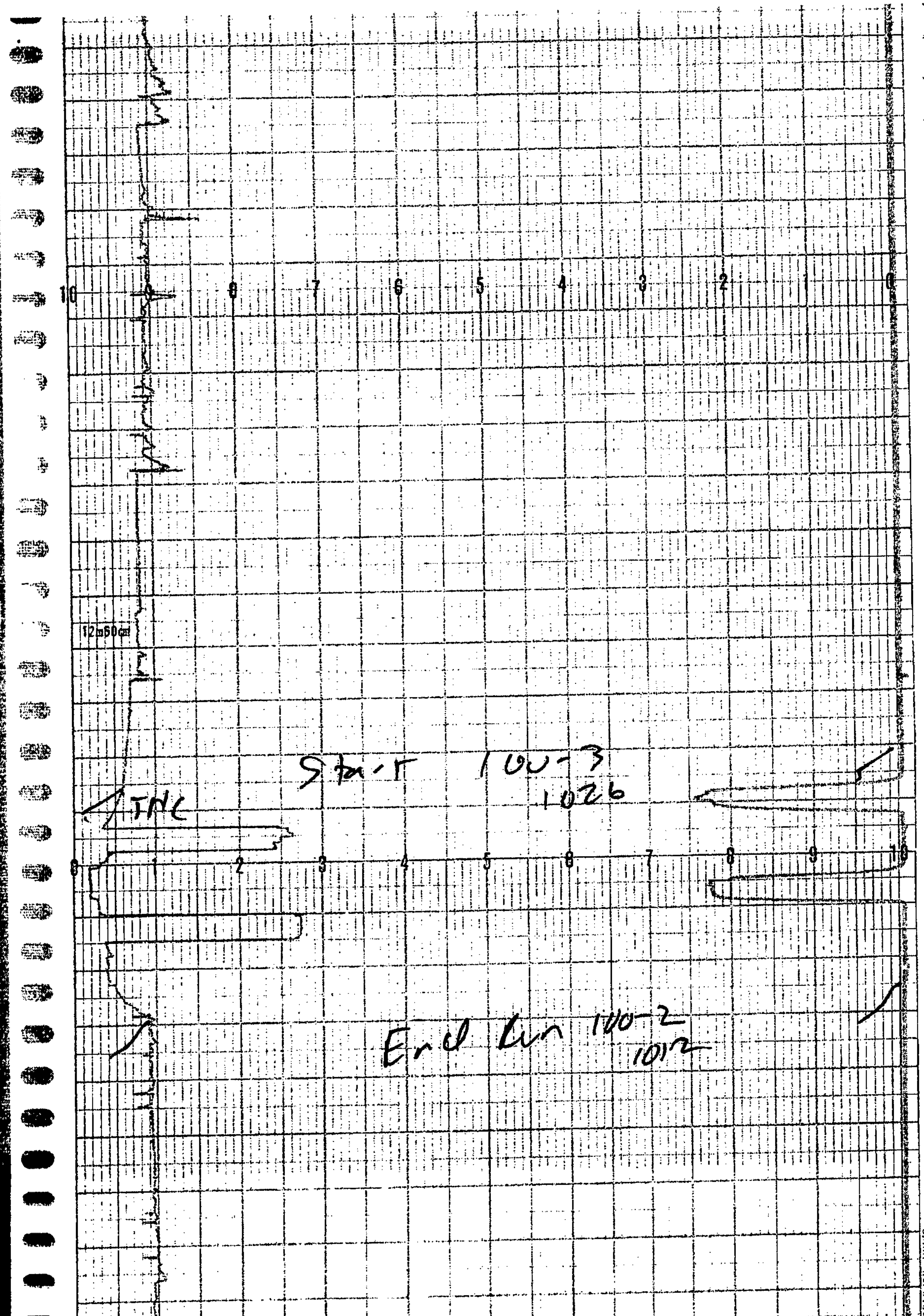


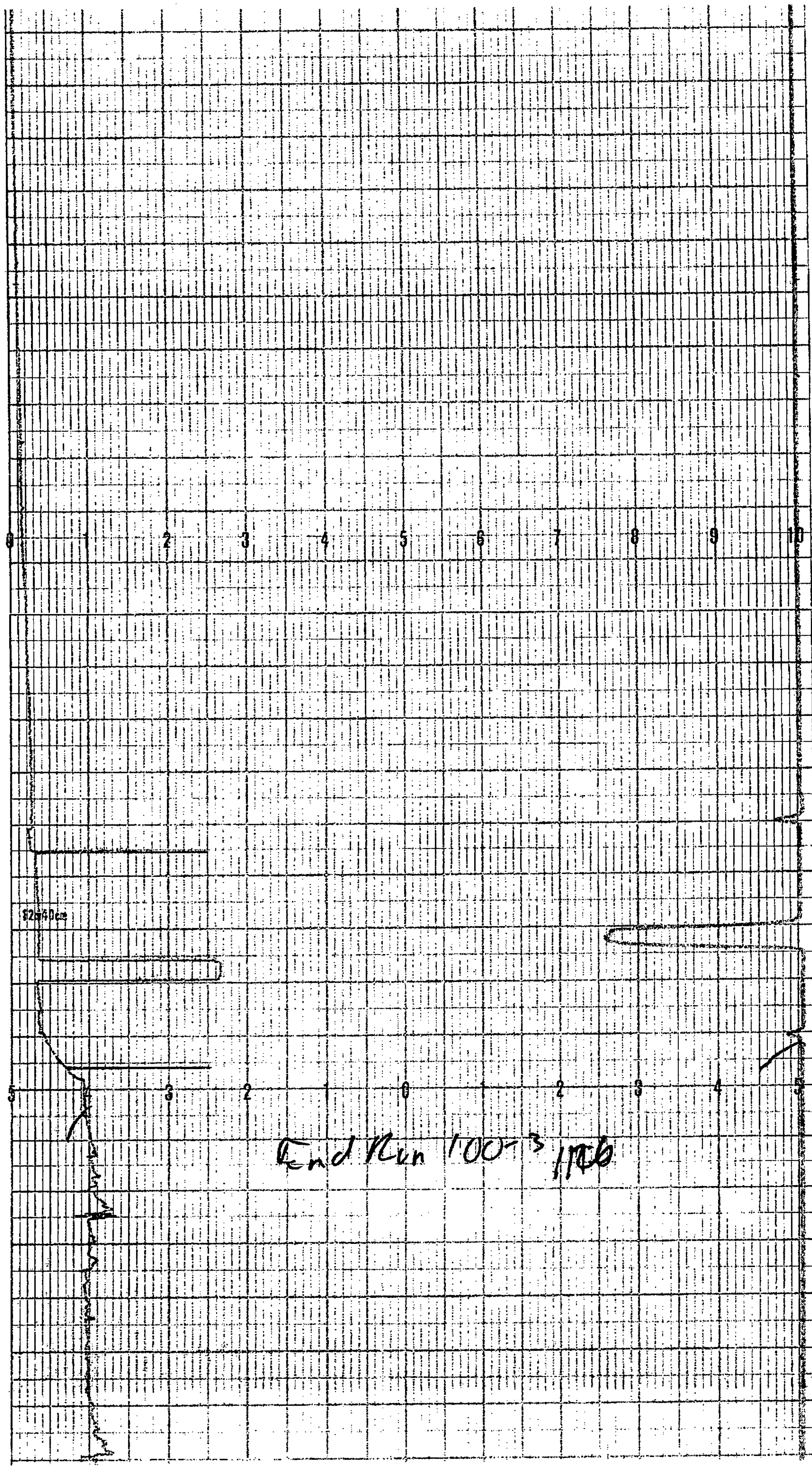
CHART NO. 89529AA/NN
5 4 3 2 1 0 1 2 3 4 5
13m40cm
Start 75-3 1725
10 9 8 7 6 5 4 3 2 1 0
End Run 75-2 1712

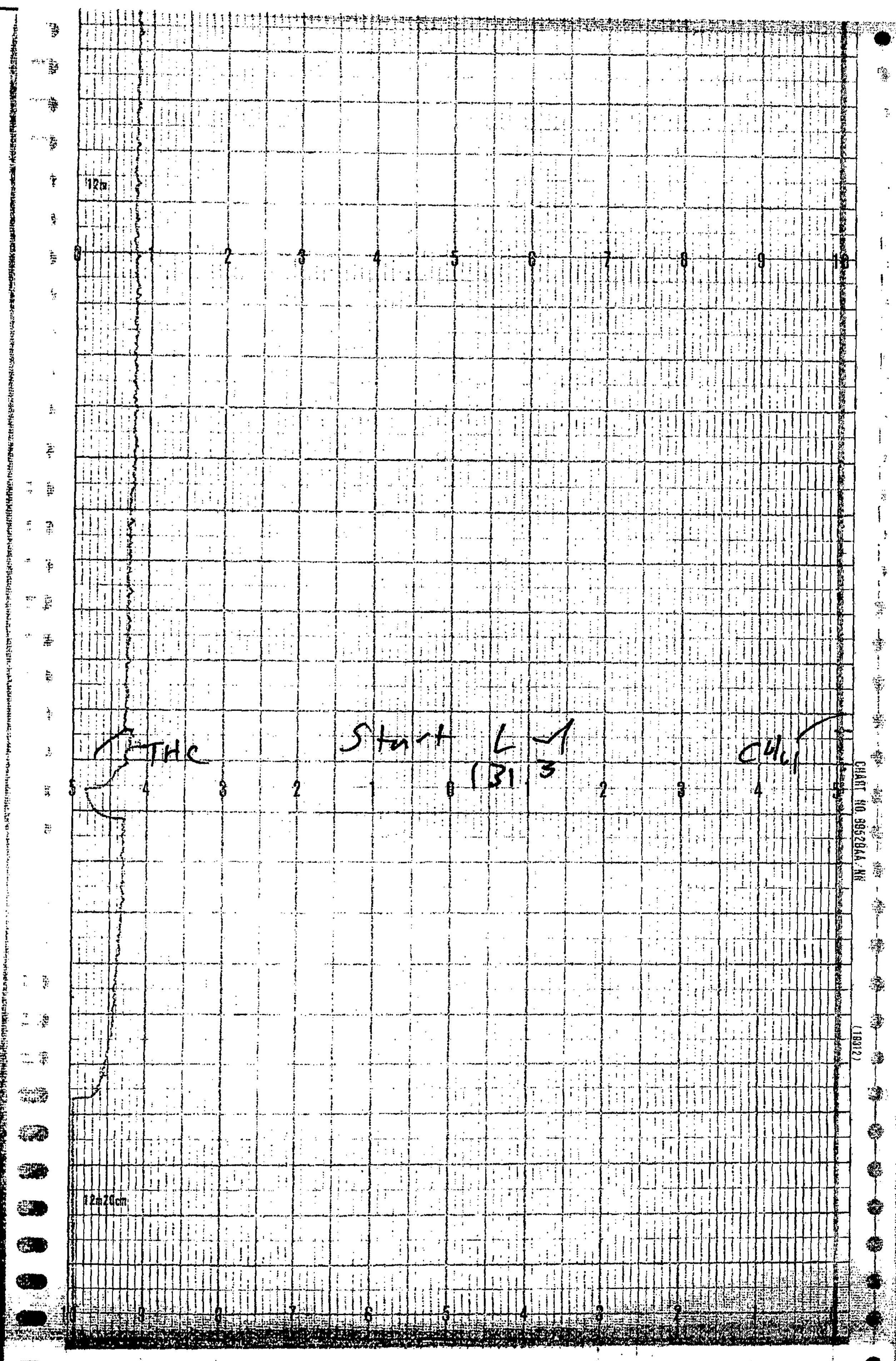


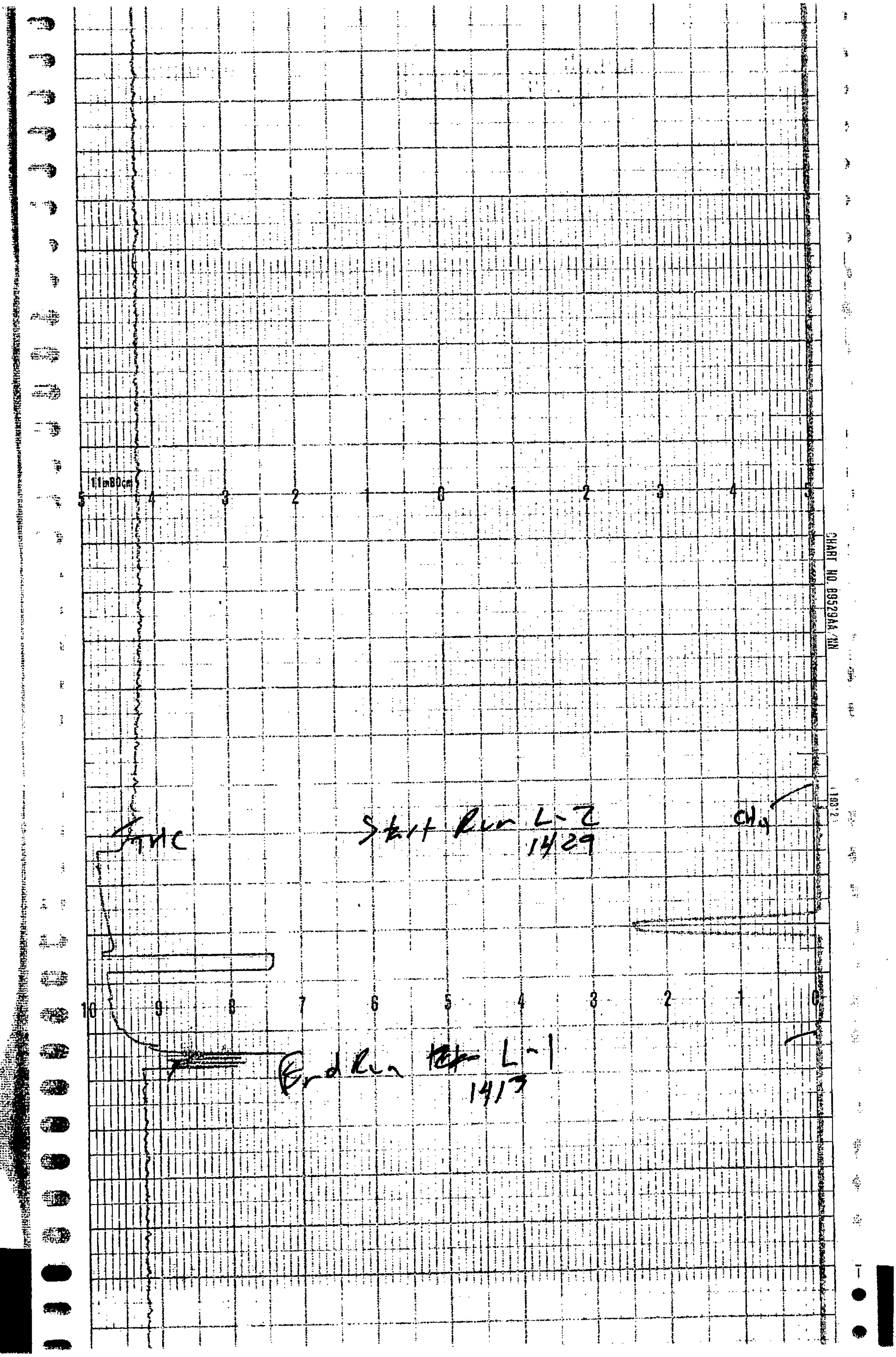
THC
243
CH4
9/10/03
THC
CH4
End Run 75-B 1825

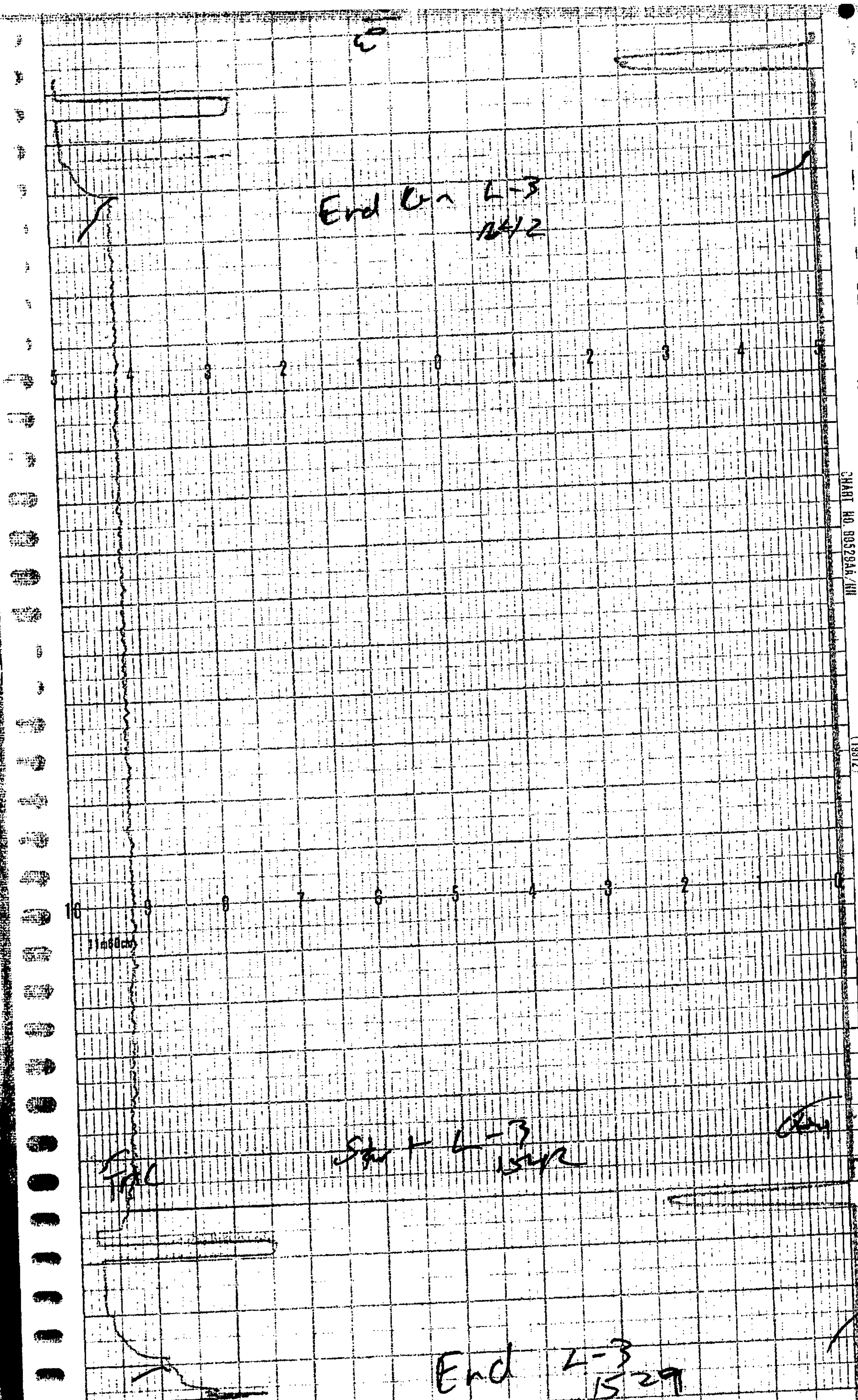

THC
Start Run 100-2
912
CH4
End Run 100-1
858
12m80cm
CHART NO. B9520AA /IN

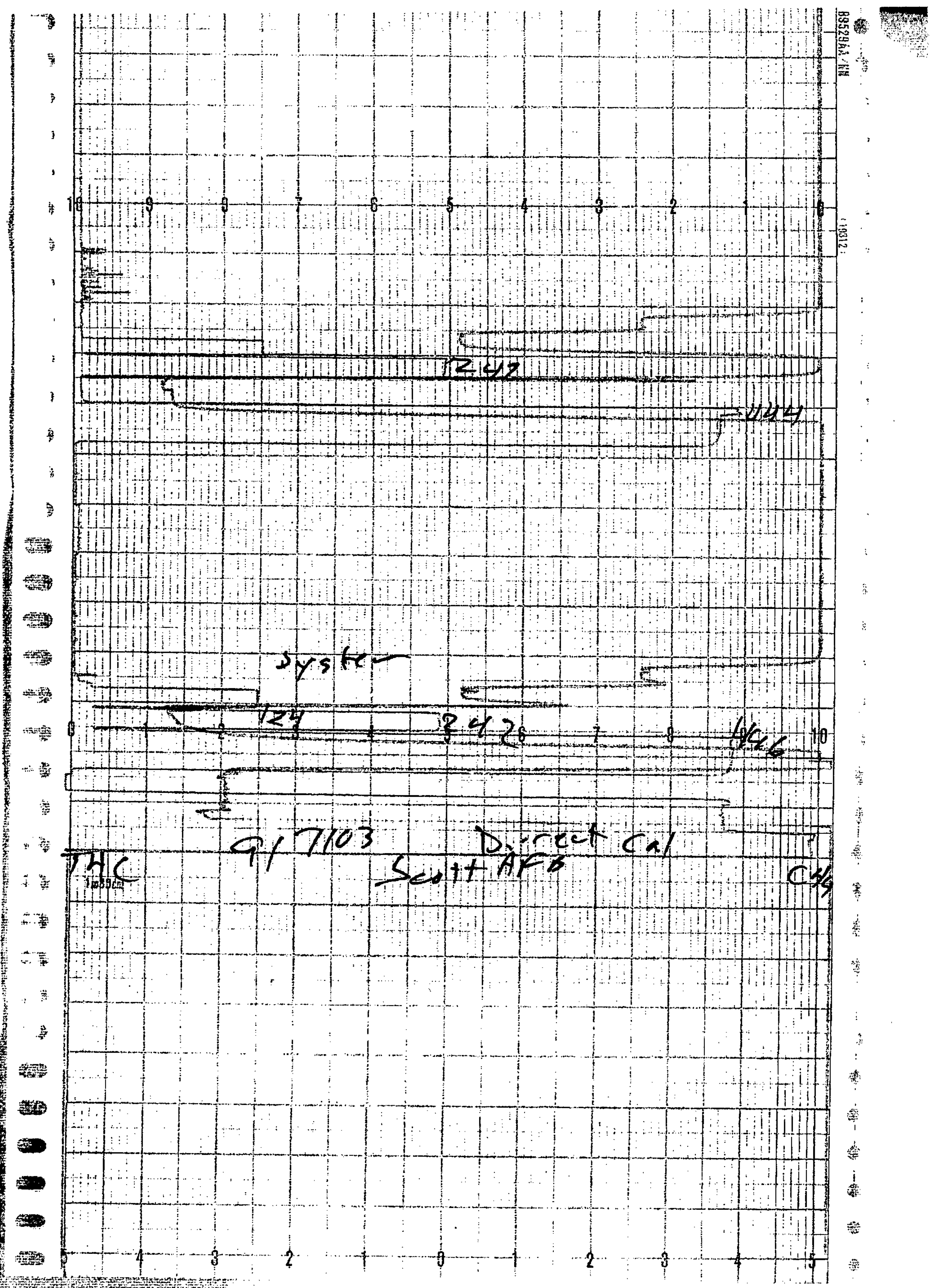

TNC
Start 100-3
1026
End Run 100-2
1012


0 1 2 3 4 5 6 7 8 9 10
82m40cm
5 4 3 2 1 0 1 2 3 4 5
End Run 100-3 1106
CHART NO. BB529AA-NN
(18012)

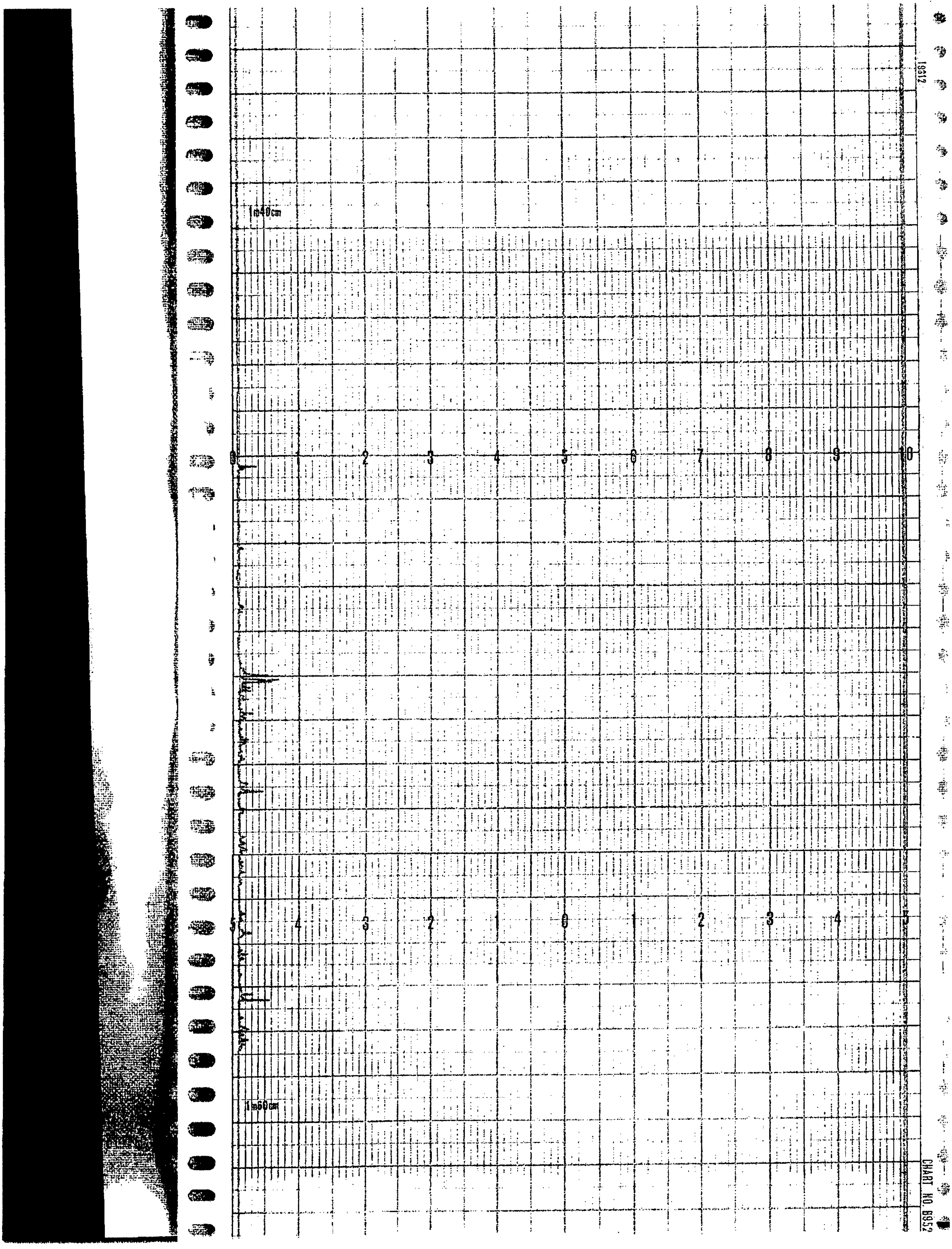

THC
Start
CH4
CHART NO. 9952BAA-NN

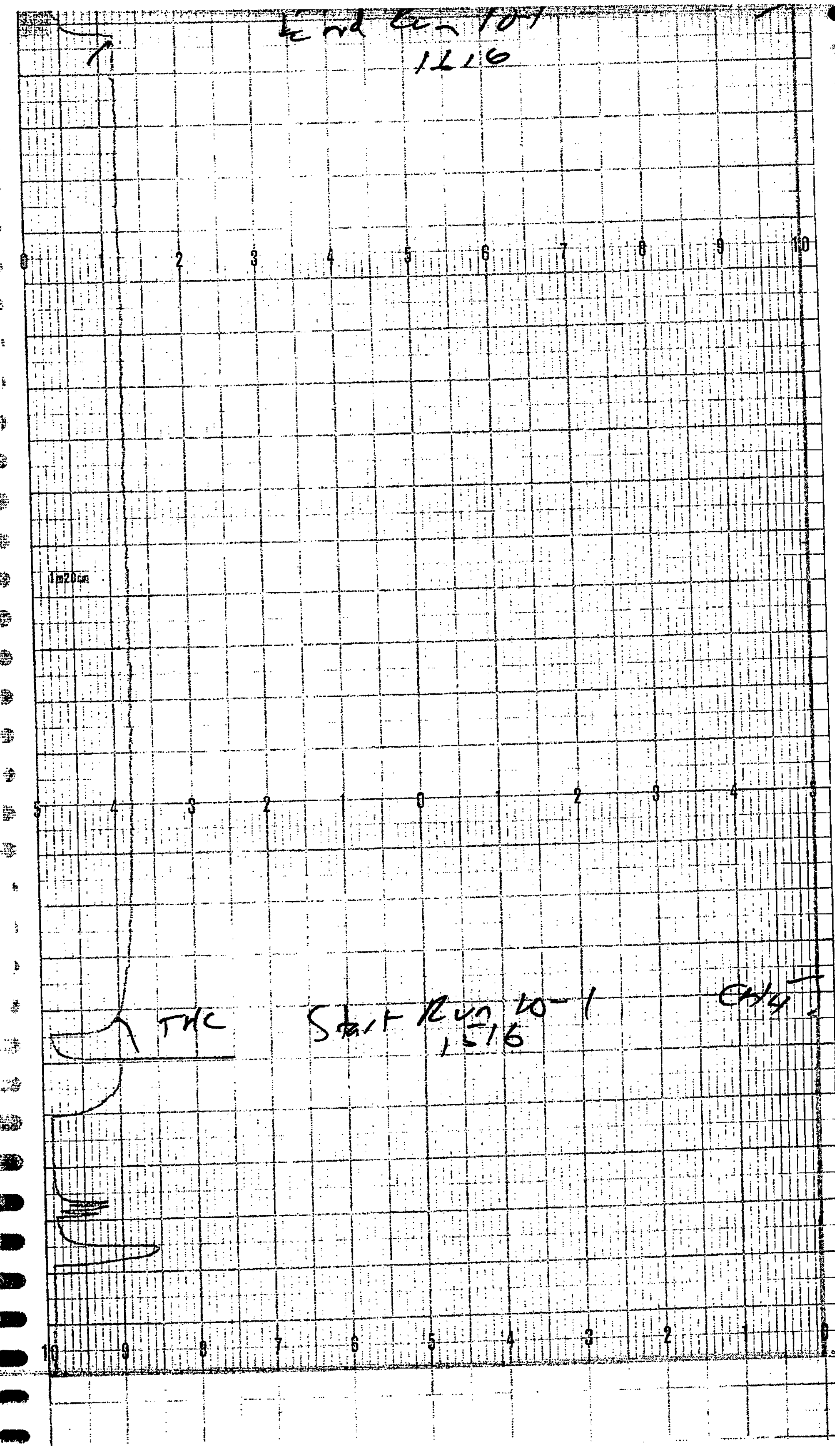

5 4 3 2 1 0 1 2 3 4 5
CHART NO. B9529AA/NN
THC
Start Run L-2
1429
CH4
10 9 8 7 6 5 4 3 2 1 0
End Run L-1
1417


End L-3
Start L-3
End L-3
1529

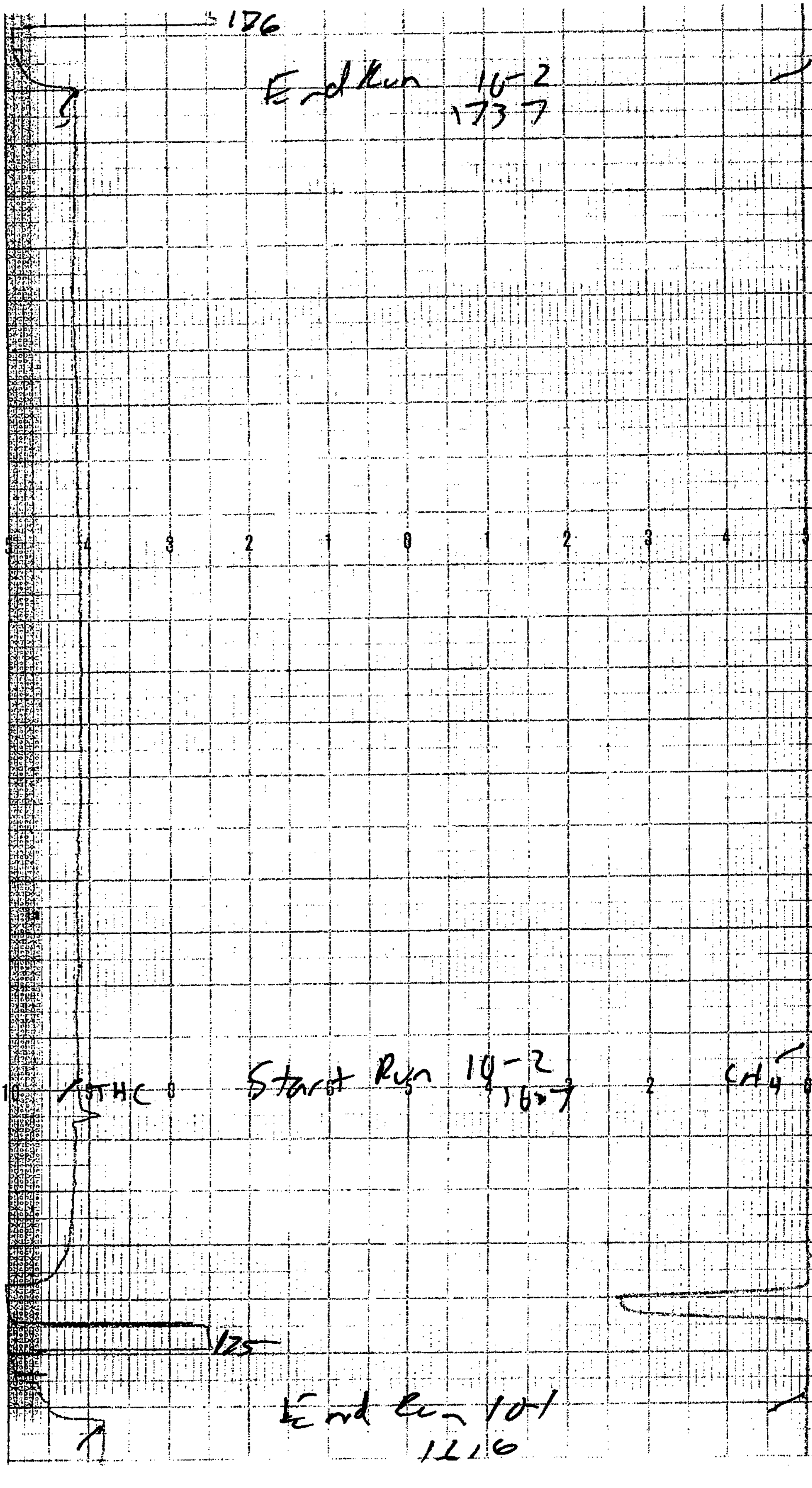


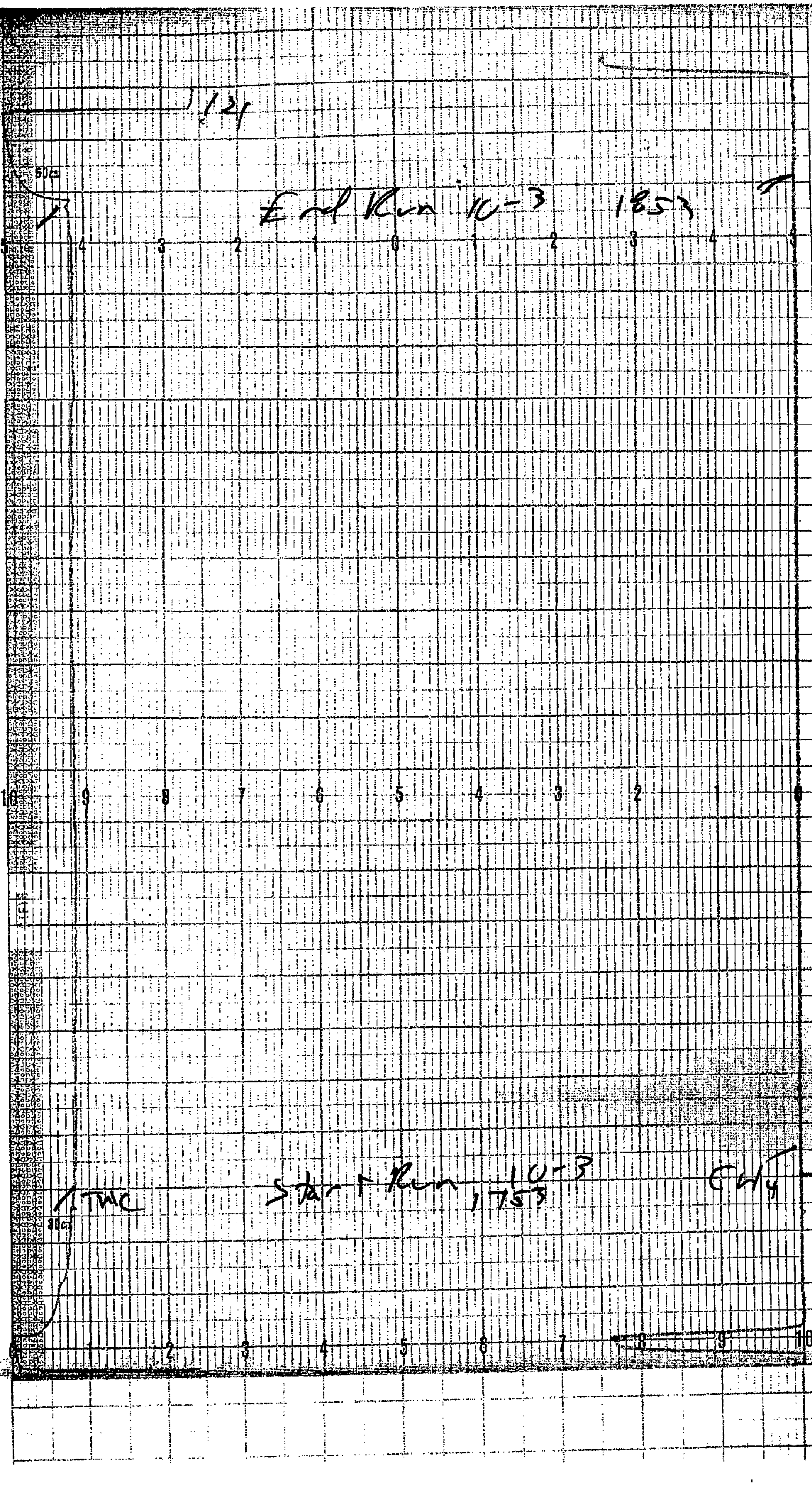
B9529AA / KN
10 9 8 7 6 5 4 3 2 1 0
1242
044
System
124
842
1046
0 1 2 3 4 5 6 7 8 9 10
9/7/03 Direct Cal
Scott AFB
THC
CH4
5 4 3 2 1 0 1 2 3 4 5


1m40cm
1m60cm
CHART NO. B952



End Run 10-1
1616
THC
Start Run 10-1
1516
CH4


186
End Run 10-2
1737
THC
Start Run 10-2
CH4
125
End Run 10-1
1216


124
End Run 10-3 1853
1TMC
Start Run 10-3 1753
CW4
CHART NO. B9529AA/NN

9/4/03

1545 STEVE FRANCIS

M303

COLLECTOR MAIN INSPECTION SHEET ??

GET TO STEVE FRANCIS

LEFT MESSAGE FAX WILL START 9/5

MAIL WKG

LIGHT UNIT

BIO DIESEL

THEN: DO GASEOUS ONLY ON DIESEL

TO GET A BASELINE

7000 CHARLIE MARZOR 726-6488

LEFT MESSAGE

GRAHAM ROBERTS 772-7001

CALL ON MONDAY

Fuel & BTU
Amp Good

FUEL = 7.4 lbs/gal

9/8/03 UNIT DG09 BIO DIESEL

SCOTT AFB 10% LOAD ~~~20~~ KVA

25 Amps

TIME	FUEL (lbs)	TEMP, °F	
1415	110.55	139	
1445	101.25	138	Δ = 32.5 lbs
1510	90.90	138	
1535	78.05	137	75 min. = 1.25 hrs
1555	68.70	135	26 lbs/hr.
1610	61.95	139	3.51 gal/hr
1625	55.30	147	hp = 10.8 / 22
RUN ADD FUEL			MAX hp = 148
1630	109.75	127	Δ = 13.4 lbs.
1705	92.75	131	30 min 26.8 lbs/hr
1730	81.80	143	3.62 gal/hr
1750	71.10	145	49.5 lbs
1805	65.10	147	105 min = 1.75 hr.
1815	60.25	149	28.29 lbs/hr. 3.82 gal/hr.
1825	55.30	150	
1850	43.05	152	

9/9/03

TIME	FUEL (lbs)	TEMP, °F	
0800	96.15	~~125~~ 92	100 Amps
0815	88.25	107	21.45 lbs
0830	80.35	118	0.67 hrs. 5.1/A
0840	74.70	119	32.02 lbs/hr 4.3 gal/hr.
ADD FUEL			
0845	102.56	112	1000 62.0 140
0920	83.25	116	40.5 lbs.
0935	75.15	135	1.25 hr. 4.38 gal/hr. 32.4 lbs/hr.

9/9/03

25% LOAD

	ADD FUEL	TEMP °F	
1015	117.35	108	Δ=46.2 lbs.
1030	108.05	129	1.42 hrs.
1105	90.60	138	32.54 lbs/hr.
			4.4 GAL/hr.
1120	82.45	142	
1140	71.15	151	

~130 AMP

hp. 81.4

50%	POWER/LOAD		135 AMPS
1150	123.05	99°F	34.8 lbs
1245	88.25	147	0.92 hrs.
			37.83 lbs/hr. 5.1 GAL/hr.
1310	73.05	156	→ 62.3 lbs.
1330	60.75	157	1.67 hrs.
			37.3 lbs/hr.
	ADD FUEL		5.0 GAL/hr.
1340	123.95	112	
1420	100.95	118	57.85 lbs.
1500	76.65	142	1.58 hrs.
1515	66.10	157	36.61 lbs/hr.
			4.95 GAL/hr.

75% LOAD			190 AMPS
			hp. 116
1540	121.45	110	
1615	95.50	135	D: 43.2 lbs.
			0.92 hrs.
1635	78.25	142	46.96 lbs/hr.
1705	53.80		6.35 GAL/hr.

67.65 lbs. 1.42 hrs. = 47.64 lbs/hr. = 6.44 GAL/hr.

-86

9/9/03 UNIT D609

75% LOAD 1 hp ~ 116

	REFUEL	TEMP °F	
			190
1720	96.80	126	~~200~~ AMPS
1750	73.05	138	43.45 lbs
1805	61.60	142	0.92 hrs.
			47.25 lbs/hr.
1815	53.35	157	= 6.35 GAL/hr.

9/10/03

100% LOAD ~ ~~280~~ 270 AMPS → CAN'T RUN FOR 4 HOURS AT 260 AMPS MAY DAMAGE LOAD BANK

→ 210 AMPS

0745	115.15	96	
0835	79.30	112	
0855	64.15	82	Δ: 69.6 lbs
			1.58 hrs
0910	54.30	88	44.05 lbs/hr
0915	49.55	90	5.95 GAL/hr.
0920	45.55	92	
ADD FUEL			
0925	101.10	85	
			51.35 lbs.
1000	77.75	95	1.25 hrs.
1040	49.75	98	41.08 lbs/hr.
			5.55 GAL/hr.
ADD FUEL			
1050	100.60	87	
1115	83.25	90	50.2 lbs
1135	66.90	92	1.17 hr
1200	50.40	96	43.03 lb/hr
			5.81 gal/hr

9/10/03

FLOSS LIGHT CART UNIT.

START RUNNING 1245

KUBOTA DIESEL — AMPS =

INITIAL FINAL

CAN 1 28.20 20.60 Δ : 7.6 lbs = 2.03 lbs/hr

1.02 GAL = 0.27 GAL/hr

RUN TIME 3:45

9/15/03

1400 SID STEPHENSON 606-

90% → 115%

IN COVER LETTER, NOTE WE ARE WANTING

APPROVAL TO RUN @ GREATER CAPACITY

1435 TONY LOGOZZO 330-244-2307

LEFT MESSAGE

SAMPLE COLLECTION

$460/SAMPLE

M24 WISCONSIN * ~~STEVE STRABE~~ DAN OMIECZNOWSKI

800-446-0403

2 wks. TRIANGLE 800-367-4862

WAYNE STOCKINGS DESICCATES

* 105/SAMPLE DONNA

MONDAY

CEM CALIBRATION DATA SHEET

Company: Scott AFB
Location: Generator Exhaust
Project No:

Operator: D. Allen
Date: 9/8/03

, EST
, Central Time

		Cal Gas Conc.	Direct Calibration Response ppm / %	% Error	Post Test Run 1 Response ppm / %	%Drift	%Bias	Post Test Run 2 Response ppm / %	%Drift	%Bias	Post Test Run 3 Response ppm / %	%Drift	%Bias	Average ~~Comments~~
			Time: 1300		Time: 1516-1616			Time: 1637-1737			Time: 1753-1853			
CO	Zero	0	-0.3	-0.2	-0.6			-0.6			-0.4			Run 1: 36.8
	Low	149.4	149	149	146			145			145			2: 36.4
	Mid	301.1	299	297										
	High	465.2	463	460										3: 36.1
CO2	Zero	0	-0.1	0.1	0.2			0.2			0.2			1: 4.2
	Low	—												2: 4.2
	Mid	10.13	10.1	10.3	10.4			10.4			10.4			
	High	20.13	20.2	20.3										3: 4.1
O2	Zero	0	0.1	0.3	0.0			0.1			0.1			1: 16.2
	Low	—												2: 16.1
	Mid	10.15	10.2	10.1										
	High	20.3	20.4	20.3	20.3			20.3			20.3			3: 16.1
THC	Zero	0	2	2	3			5			6			1: 60.8
	Low	124.6	124	126	125			128			122			2: 44.3
	Mid	246.7	244	247										
	High	442	442	444										3: 42.9
NOx	Zero	0	-2	-2	-2			4			6			1: 1337
	Low	—	—	—										2: 1315
	Mid	248.8	245	244	246			252			256			
	High	448	446	442										3: 1300

	CH_4	NO
1:	3.9	922
2:	3.6	885
3:	3.5	856

25-1: 804-904
25-2: 925-1025
25-3: 1042-1142
50-1: 1155-~~1255~~1255
50-2: 1310-1410
1424-1524
50-3: ~~1540-1640~~
75-1: 1540-1640
75-2: 1652-~~1752~~ 1712
75-3: 1725-1825

CEM CALIBRATION DATA SHEET

Company: Scott AFB
Location: Generator Exhaust
Project No:

Operator: D. All
Date: 9/9/03

		Cal Gas Conc.	Direct Calibration Response ppm / %	Direct Calibration Response % Error	Post Test Run 1 (25%) Response ppm / %	Post Test Run 1 %Drift	Post Test Run 1 %Bias	Post Test Run 2 (50%) Response ppm / %	Post Test Run 2 %Drift	Post Test Run 2 %Bias	Post Test Run 3 (75%) Response ppm / %	Post Test Run 3 %Drift	Post Test Run 3 %Bias	Comments
			Time: 7/5		Time:			Time:			Time:			
CO	Zero	0	-0.7	-0.7	-0.6	-0.6	-0.6	-0.7	-1.1	-1.2	-1.2	-1.2	-1.2	
	Low	149.4		149	149	149	148	148	147	147	147	147	147	
	Mid	301.1		300										
	High	465.2	465	466										
CO_2	Zero	0	0.1	0.1	0.2	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.1	
	Low	—	—	—										
	Mid	10.13	10.3	10.3	10.3	10.2	10.2	10.3	10.2	10.2	10.1	10.1	10.2	
	High	20.13	20.3	20.3										
O_2	Zero	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	
	Low	—	—	—										
	Mid	10.15	10.2	10.2										
	High	20.3	20.4	20.3	20.4	20.4	20.4	20.4	20.4	20.3	20.3	20.3	20.3	
THC	Zero	0	0	0.5	3	10*	10*	10*	10*	10*	11	8.8	8	
	Low	124.6		124	128	129	127	128	126	125	128	125	129	
	Mid	246.7		24.6										
	High	442	444	442		*- Going	down further							
NOx	Zero	0	-0.3	0.0	6	6	8	12	12	12	14	10	10	
	Low	—		—										
	Mid	248.8		250	255	256	256	253	248	248	255	251	251	
	High	446	448	446										

Averages

CO	37.7	39.0	40.2	43.4	43.0	42.4	81.1	76.2	73.1
O_2	15.9	15.6	15.6	14.7	14.6	14.7	12.8	12.8	12.9
CO_2	4.3	4.4	4.4	4.9	4.9	4.8	6.2	6.2	6.1
THC	47.4	45.1	43.3	49.3	46.6	42	51.5	37.4	38.2
NOx	1411	1494	1434	1730	1752	1741	2310	2308	2224
NO	904	952	1003	1149	1168	1245	1512	1517	1461
CH_4	3.2	3.0	0.5	0.4	0.4	0.2	0.1	0.0	0.0

CEM CALIBRATION DATA SHEET

100-1: 758 - 858
100-2: 912 - 1012
100-3: 1026 - 1126
L-1: 1313 - 1413
L-2: 1429 - 1529
L-3: 1542 - 1642

Company: Scott AFB
Location: Generator Exhaust
Project No:

Operator: D. Allen
Date: 9/10/07

L-1 L-2 .

100% Load

Lt Generator L-3

~~[illegible]~~

Gas	Level	Cal Gas Conc.	Direct Calibration Response ppm / %	Direct Calibration Response % Error	Post Test Run 1 Response ppm / %	Post Test Run 1 %Drift	Post Test Run 1 %Bias	Post Test Run 2 Response ppm / %	Post Test Run 2 %Drift	Post Test Run 2 %Bias	Post Test Run 3 Response ppm / %	Post Test Run 3 %Drift	Post Test Run 3 %Bias	Comments
			Time: 710		Time:			Time:			Time:			
CO	Zero	0	-0.8	-0.8	-0.8	-0.8	-0.8	-1.8	-1.8					
	Low	149.4		150	149	149	148	146	145	144				
	Mid	301.1		301										
	High	465.2	461	461										
CO_2	Zero	0	-0.1	0.0	-0.1	-0.1	-0.1	-0.2	0.2	-0.1				
	Low	—	—	—										
	Mid	10.13	10.2	10.1	10.1	10.1	10.1	10.1	10.1	10.1				
	High	20.13	20.1	20.0										
O_2	Zero	0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	0.2	-0.1				
	Low	—	—	—										
	Mid	10.15	10.0	10.0										
	High	20.3	20.2	20.2	20.2	20.2	20.1	20.1	20.1	20.2				
THC	Zero	0	-2	-2	7*	10	10	7	6	5				
	Low	124.6		121	130	132	129	125	123	122				
	Mid	246.7		243										
	High	442	443	440										
NOx	Zero	0	-3	-3	6	7	9	9	4	4				
	Low	—		—										
	Mid	249.8		247	255	252	255	250	248	243				
	High	448	447	447										

Averages

CO	42.9	45.5	45.8	181.4	180.9	176.4
CO_2	5.4	5.6	5.6	4.1	4.1	4.3
O_2	13.7	13.3	13.6	14.9	15.1	15.3
THC	36.5	41.0	42.3	35.3	36.0	34.8
NOx	2041	2000	2004	277.6	243.0	261.1
NO	1262	1377	1368	192.0	198.1	196.8
CH_4	-0.7	-0.9	-0.9	-0.9	-1.0	-1.0

-86 GENERATOR

FIELD DATA SHEET

K= 1.89

Plant: Scott Air Force Base
Sample Type: Particulate Method 5
Operator: MT
Nozzle ID: .195
Thermocouple #: ____

Sampling Location: Generator 10% Load
Pbar: 30.65
Ps: 7.3
Assumed Bws: ____
Filter #: 830573

Run Number: 10-1
Date: [illegible] 9-8-03
CO_2: 3.2
O_2: 16.6
Meter Box #: 7
Y: 1.006
ΔH@: 1.631

Pretest Leak Rate: .006 cfm @ 15 in.Hg.
Probe Length/Type: 3 Ft.
Pitot#: ____
Post-Test Leak Rate: ____ cfm @ ____ in.Hg.

Pretest Leak Check: Pitot: ✓ Orsat: —
Stack Diameter: ____
As: ____
Post-Test Leak Check: Pitot: ✓ Orsat: —

Traverse Point Number	Sampling Time	Clock Time 15:13	Gas Meter Reading	Velocity Head	ΔH Desired	ΔH Actual	Stack Temp (Ts)	Temperature °F Probe	Temperature °F Filter	Impinger Temp. °F	Dry Gas Meter Temp. Tm Inlet	Dry Gas Meter Temp. Tm Outlet	Pump Vacuum (in. Hg)
0	0	[illegible]	348.723										
1	2.5	15:16	350.7	1.61	2.2	2.2	300	250	251	59	84	84	2
	5	15:18	352.8	1.61	2.2	2.2	300	251	250	59	82	84	2
	7.5	15:20	354.9	1.61	2.2	2.2	300	250	251	54	83	84	2
	10	15:23	357.0	1.61	2.2	2.2	300	250	250	53	84	84	2
	12.5	15:25	359.0	1.61	2.2	2.2	300	250	251	55	85	84	2
	15	15:28	361.0	1.61	2.2	2.2	300	250	250	57	86	84	2
	17.5	15:30	363.2	1.61	2.2	2.2	300	250	250	58	87	84	2
	20	15:33	365.2	1.61	2.2	2.2	300	251	250	60	88	84	2
	22.5	15:35	367.3	1.61	2.2	2.2	300	249	248	61	89	84	2
	25	15:38	369.4	1.61	2.2	2.2	300	251	252	61	90	85	2
	27.5	15:40	371.4	1.61	2.2	2.2	300	248	250	62	91	85	2
	30	15:43	373.5	1.61	2.2	2.2	300	251	250	61	92	85	2
	32.5	15:45	375.5	1.61	2.2	2.2	300	250	251	59	93	85	2
	35	15:48	378.0	1.61	2.2	2.2	300	250	250	58	93	86	2
	37.5	15:50	379.7	1.61	2.2	2.2	300	249	249	57	94	86	2
	40	15:53	381.7	1.61	2.2	2.2	300	250	249	57	94	86	2
	42.5	15:55	383.8	1.61	2.2	2.2	300	249	250	57	95	86	2
	45	15:58	385.9	1.61	2.2	2.2	300	250	251	56	95	87	2
	47.5	16:00	388.0	1.61	2.2	2.2	300	249	251	56	95	87	2
	50	16:03	390.0	1.61	2.2	2.2	300	251	250	56	96	87	2
	52.5	16:05	392.2	1.61	2.2	2.2	300	250	250	57	96	88	2
	55	16:08	394.3	1.61	2.2	2.2	300	249	251	57	97	88	2
	57.5	16:10	396.5	1.61	2.2	2.2	300	251	250	57	97	88	2
	60	16:13	398.552	1.61	2.2	2.2	300	249	250	56	97	88	2

ΔVm = 49.829 ✓ $\sqrt{\Delta p}$ = 1.27 ✓ 1.61 ✓ 1.2688 $\overline{\Delta H}$ = 2.2 ✓ $\overline{Ts}$ = 300 ✓ $\overline{Tm}$ = 88 ✓

✓ TA 9/23

Environmental Quality Management, Inc.

SAMPLE RECOVERY DATA

Plant Scott Air Force Base Run No. 10-5-1
Date 9/8/03 Sample Box No. HSB 1 Job No.
Sample Location 10 % Load Filter No. 830573
Train Preparer DT
Sample Recovery Person DA
Comments

Front Half
Acetone Container No. Liquid Level Marked Sealed

Filter Container No. ~~[illegible]~~ Sealed

Description of Filter Black - decent Loading

Samples Stored and Locked

Back Half/Moisture
Container No.

Liquid Level Marked Sealed

Imp. No.	Contents	Initial Vol (ml)	Weight (grams) Initial	Final	Net
1	DI H_2O	100 mL	731.3	746.1	14.8 ✓
2	DI H_2O	100 mL	714.5	728.9	14.4 ✓
3	–	–	621.2	623.2	2.0 ✓
4	Silica Gel	–	849.2	858.4	9.2 ✓
5					
6					
Total					40.4 ✓

Description of Impinger Catch: Cloudy

✓ TLA 9/23

FIELD DATA SHEET

K = 1.89

Plant: Scott Air Force Base Sample Type: Particulate Method 5 Operator: MT
Sampling Location: Generator 10% Load Pbar: 30.65 Ps: -7.3
Run Number: 10-2 Date: 9-8-03 CO_2: 3.2 O_2: 16.6
Pretest Leak Rate: .004 cfm @ 13 in.Hg. Probe Length/Type: 3 Ft. Pitot#:
Pretest Leak Check: Pitot: ✓ Orsat: — Stack Diameter: As:

Nozzle ID: 0.195 Thermocouple #:
Assumed Bws: Filter #: ~~[illegible]~~ PC025
Meter Box #: 7 Y: 1.006 ΔH@: 1.631
Post-Test Leak Rate: .001 cfm @ 12 in.Hg.
Post-Test Leak Check: Pitot: ✓ Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH Desired	ΔH Actual	Stack Temp (Ts)	Temperature °F Probe	Temperature °F Filter	Impinger Temp. °F	Dry Gas Meter Temp. Tm Inlet	Dry Gas Meter Temp. Tm Outlet	Pump Vacuum (in. Hg)
0	0	16:37	399.494										
1	2.5	16:39	401.6	1.61	2.2	2.2	300	253	256	66	89	88	4
	5	16:42	403.6	1.61	2.2	2.2	300	251	252	60	90	88	5
	7.5	16:44	405.7	1.61	2.2	2.2	300	250	251	55	90	88	5
	10	16:47	407.7	1.61	2.2	2.2	300	250	251	54	91	88	6
	12.5	16:49	409.8	1.61	2.2	2.2	300	250	250	54	92	88	7
	15	16:52	411.8	1.61	2.2	2.2	300	251	250	55	92	88	7
	17.5	16:54	413.9	1.61	2.2	2.2	300	250	251	54	93	88	7
	20	16:57	416.0	1.99	2.1	2.1	510	250	250	55	93	88	8
	22.5	16:59	418.0	1.99	2.1	2.1	510	249	250	56	94	88	8
	25	17:02	419.9	1.99	2.1	2.1	510	250	250	58	94	88	8
	27.5	17:04	421.9	1.99	2.1	2.1	510	249	253	57	94	88	9
	30	17:07	424.0	1.99	2.1	2.1	510	250	252	58	94	88	10
	32.5	17:09	425.9	1.99	2.1	2.1	510	250	249	58	94	88	10
	35	17:12	427.9	1.99	2.1	2.1	510	250	250	59	94	88	10
	37.5	17:14	430.0	1.99	2.1	2.1	510	250	250	58	94	88	11
	40	17:17	431.9	1.99	2.1	2.1	510	250	250	60	94	88	11
	42.5	17:19	433.9	1.99	2.1	2.1	510	250	251	59	94	88	11
	45	17:22	435.9	1.99	2.1	2.1	510	251	251	60	94	88	12
	47.5	17:24	438.0	1.99	2.1	2.1	510	250	250	59	94	88	12
	50	17:27	440.0	1.99	2.1	2.1	510	250	250	60	93	88	12
	52.5	17:29	441.9	1.99	2.1	2.1	510	250	251	60	93	88	12
	55	17:32	443.9	1.99	2.1	2.1	510	250	250	60	93	88	12
	57.5	17:34	446.1	1.99	2.1	2.1	510	250	249	61	93	88	12
	60	17:37	448.041	1.99	2.1	2.1	510	250	250	60	93	88	12

ΔVm = 48.547 $\overline{\sqrt{\Delta p}}$ = 1.37 ✓ 1.88 ✓ $\overline{\Delta H}$ = 2.13 ✓ $\overline{Ts}$ = ~~510~~ 449 ✓ $\overline{Tm}$ = 90.5 ✓

1.3693

JTD 9/23

Environmental Quality Management, Inc.

SAMPLE RECOVERY DATA

Plant Scott Air Force Base Run No. 10-5-2
Date 9/8/05 Sample Box No. HSB-4 Job No.
Sample Location 10% Load - Generator Filter No. PC025
Train Preparer DT
Sample Recovery Person DA
Comments

Front Half
Acetone Container No. ______ Liquid Level Marked ______ Sealed ______

Filter
Container No. ______ Sealed ______

Description of Filter Black Loading

Samples Stored and Locked ______

Back Half/Moisture
Container No. ______

Liquid Level Marked ______ Sealed ______

Imp. No.	Contents	Initial Vol (ml)	Weight (grams) Initial	Final	Net
1	DI H_2O	100 mL	710.3	729.9	19.6 ✓
2	DI H_2O	100 mL	723.2	733.8	10.6 ✓
3	–	–	619.0	621.3	2.3 ✓
4	Silica Gel	–	860.9	871.3	10.4 ✓
5					
6					
Total					42.9 ✓

Description of Impinger Catch: Cloudy

FIELD DATA SHEET

Plant: Scott Air Force Base
Sample Type: Particulate Method 5
Operator: MV
Nozzle ID: 0.183
K = 1.45
Thermocouple #:

Sampling Location: Generator 10% Load
Pbar: 30.65
Ps: 7.3
Assumed Bws:
Filter #: 830574

Run Number: 10-3
Date: 9-8-03
CO_2: 3.2
O_2: 16.6
Meter Box #: 7
Y: 1.006
ΔH@: 1.631

Pretest Leak Rate: .001 cfm @ 13 in.Hg.
Probe Length/Type: 3Ft
Pitot#:
Post-Test Leak Rate: .008 cfm @ 1 in.Hg.

Pretest Leak Check: Pitot: ✓ Orsat: —
Stack Diameter:
As:
Post-Test Leak Check: Pitot: ✓ Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading ✓	Velocity Head	ΔH Desired	ΔH Actual	Stack Temp (Ts)	Temperature °F Probe	Temperature °F Filter	Impinger Temp. °F	Dry Gas Meter Temp. Tm Inlet	Dry Gas Meter Temp. Tm Outlet	Pump Vacuum (in. Hg)
0	0	17:52	448.286										
1	2.5	17:54	450.1	1.99	1.6	1.6	510	251	252	64	87	87	1
	5	17:57	451.9	1.99	1.6	1.6	510	251	254	61	89	87	1
	7.5	17:59	453.8	1.99	1.6	1.6	510	249	252	56	90	87	1
	10	18:02	455.6	1.99	1.6	1.6	510	250	251	54	91	87	1
	12.5	18:04	457.4	1.99	1.6	1.6	510	250	250	54	92	87	1
	15	18:07	459.3	1.99	1.6	1.6	510	250	250	54	94	87	1
	17.5	18:09	461.0	1.99	1.6	1.6	510	250	250	54	95	87	1
	20	18:12	462.8	1.99	1.6	1.6	510	250	252	54	95	88	1
	22.5	18:14	464.7	1.99	1.6	1.6	510	250	251	53	96	88	1
	25	18:17	466.4	1.99	1.6	1.6	510	249	250	54	96	88	1
	27.5	18:19	468.2	1.99	1.6	1.6	510	250	250	53	96	88	1
	30	18:22	470.1	1.99	1.6	1.6	510	250	249	54	96	88	1
	32.5	18:24	471.8	1.99	1.6	1.6	510	251	251	53	96	88	1
	35	18:27	473.7	1.99	1.6	1.6	510	249	249	54	97	88	1
	37.5	18:29	475.6	1.99	1.6	1.6	510	250	250	54	97	88	1
	40	18:32	477.4	1.99	1.6	1.6	510	250	251	55	97	89	1
	42.5	18:34	479.2	1.99	1.6	1.6	510	250	251	54	97	89	1
	45	18:37	481.1	1.99	1.6	1.6	510	250	249	55	97	89	1
	47.5	18:39	482.9	1.99	1.6	1.6	510	250	251	54	97	89	1
	50	18:42	484.7	1.99	1.6	1.6	510	250	249	54	97	89	1
	52.5	18:44	486.4	1.99	1.6	1.6	510	250	250	54	97	89	1
	55	18:47	488.3	1.99	1.6	1.6	510	250	250	54	97	89	1
	57.5	18:49	490.1	1.99	1.6	1.6	510	250	250	54	97	89	1
	60	18:52	492.019	1.99	1.6	1.6	510	250	250	54	97	89	1

ΔVm = 43.733 ✓ $\overline{\sqrt{\Delta p}}$ = 1.4107 ✓ 1.99 ✓ $\overline{\Delta H}$ = 1.6 ✓ $\overline{Ts}$ = 510 ✓ $\overline{Tm}$ = 91.5 ✓

MV 9/15/03

Environmental Quality Management, Inc.

SAMPLE RECOVERY DATA

Plant SCOTT AIR FORCE BASE
Run No. 10-5-3
Date 9/8/03
Sample Box No. HSB 3
Job No.
Sample Location Generator Exhaust - 10% Load
Filter No. 830574
Train Preparer DT
Sample Recovery Person DA
Comments

Front Half
Acetone Container No. Liquid Level Marked Sealed

Filter Container No. Sealed

Description of Filter Black loading

Samples Stored and Locked

Back Half/Moisture
Container No.

Liquid Level Marked Sealed

Imp. No.	Contents	Initial Vol (ml)	Weight (grams) Initial	Final	Net
1	DI H_2O	100 mL	730.9	754.8	23.9 ✓
2	DI H_2O	100 mL	716.8	722.2	5.4 ✓
3	—	—	607.8	608.3	0.5 ✓
4	SILICA GEL	—	849.1	856.0	6.9 ✓
5					
6					
Total					36.7 ✓

Description of Impinger Catch: Cloudy

ADP 9/15

Environmental Quality Management, Inc.

GAS VELOCITY AND VOLUMETRIC FLOW RATE

Plant: Scott AFB Date: 9/8/03
Sampling Location: – Ble Generator Exhaust Clock Time: 1650 -
Run #: 10-1,2,3 Operators: RK/TG
Barometric Pressure, in.Hg: 30.65 Static Pressure, in.H_2O:
Moisture, %: 3 Molecular wt., Dry: Pitot Tube, Cp: 0.99
Stack Dimension, in. Diameter or Side 1: 3.0" Side 2: —
Wet Bulb, °F: — Dry Bulb, °F: —
Pitot # Thermocouple #

Condition 10% Run 1 1550- 1554

Traverse Point Number	Velocity Head in.H_2O	Stack Temp, °F
1	5.5	510
2	5.9	512
3	6.1	513
4	6.0	513
5	5.9	514
6	5.6	513
1	6.1	512
2	6.3	514
3	6.1	514
4	6.0	513
5	5.9	511
6	5.5	510
1	~~6.0~~ 5.9	513
2	~~5.5~~ 6.0	515
3	6.1	516
4	6.0	515
5	5.3	512
6	4.8	510
1	5.5	513
2	5.8	514
3	6.1	516
4	6.0	515
5	5.8	514
6	5.6	512
	$\overline{\sqrt{\Delta P}}$ =	$\overline{Ts}$ =

10% Condition Run 2 1710-

$Md = (0.44 \times \% CO_2) + (0.32 \times \% O_2) + (0.28 \times \% N_2)$

$Md = (0.44 \times \quad) + (0.32 \times \quad) + (0.28 \times \quad)$

$Md =$ 29.5

$Ms = Md \times \left(1 - \frac{\% H_2O}{100}\right) + 18\left(\frac{\% H_2O}{100}\right)$

$Ms = (\quad) \times \left(1 - \frac{}{100}\right) + 18\left(\frac{}{100}\right)$

$Ms =$ ~~30.98~~ 28.8

$\overline{Ts} =$ °F = °R(°F + 460)

$Ps = Pb + \frac{S.P.}{13.6} = (\quad) + \frac{}{13.6}$

$Ps =$ 30.9 in Hg

$\overline{\sqrt{\Delta P}} =$

$Vs = 85.49 \times Cp \times \overline{\sqrt{\Delta P}} \times \sqrt{\frac{Ts(°R)}{Ps \times Ms}}$

$Vs = 85.49 \times (\quad) \times (\quad) \times \sqrt{\quad}$

$Vs =$ 214.8 ft/s

$As =$ ft²

$Qs = Vs \times As \times 60$

$Qs = \quad \times \quad \times 60$

$Qs =$ 632.7 acfm

$Qs_{std} = Qs \times 17.647 \times \frac{Ps}{Ts} \times \left(1 - \frac{\% H_2O}{100}\right)$

$Qs_{std} = \quad \times 17.647 \times \frac{}{} \times \left(1 - \frac{}{100}\right)$

$Qs_{std} =$ 345.3 dscfm

Static = + 4.6"

0.0873 ft²

120.8 fps

1.011

~~207.83~~

85.53

ΔP 1.99 for Run 2

Static = 3.5"

Run 1 ΔP = 5.9 Ts = 512
$\sqrt{\Delta P}$ = 2.43

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Run 2

/

Environmental Quality Management, Inc

GAS VELOCITY AND VOLUMETRIC FLOW RATE

Plant: Scott AFB Date: 9/6/03
Sampling Location: – 86 Generator Clock Time: 1805–1810
Run #: 10-3 Operators: RK/TG
Barometric Pressure, in.Hg: 30.65 Static Pressure, in.H_2O:
Moisture, %: Molecular wt., Dry: Pitot Tube, Cp: 0.99
Stack Dimension, in. Diameter or Side 1: 3" Side 2: —
Wet Bulb, °F: Dry Bulb, °F:
Pitot # Thermocouple #

Traverse Point Number	Velocity Head in.H_2O	Stack Temp, °F
1	6.0	513
2	6.2	512
3	6.2	513
4	6.1	514
5	5.9	513
6	5.4	511
1	6.1	515
2	5.9	515
3	5.8	514
4	5.7	512
5	5.3	511
6	5.1	510
	$\overline{\sqrt{\Delta P}}$ =	$\overline{Ts}$ =

$Md = (0.44 \times \% CO_2) + (0.32 \times \% O_2) + (0.28 \times \% N_2)$

$Md = (0.44 \times \quad) + (0.32 \times \quad) + (0.28 \times \quad)$

$Md =$

$Ms = Md \times \left(1 - \frac{\% H_2O}{100}\right) + 18\left(\frac{\% H_2O}{100}\right)$

Static = +3.5

$Ms = (\quad) \times \left(1 - \frac{}{100}\right) + 18\left(\frac{}{100}\right)$

$Ms =$

$\overline{Ts} = \quad °F = \quad °R(°F + 460)$

$Ps = Pb + \frac{S.P.}{13.6} = (\quad) + \frac{}{13.6}$

$Ps = \quad in\ Hg$

$\overline{\sqrt{\Delta P}} =$

$Vs = 85.49 \times Cp \times \overline{\sqrt{\Delta P}} \times \sqrt{\frac{Ts(°R)}{Ps \times Ms}}$

$Vs = 85.49 \times (\quad) \times (\quad) \times \sqrt{\quad}$

$Vs = \quad ft/s$

$As = \quad ft^2$

$Qs = Vs \times As \times 60$

$Qs = \quad \times \quad \times 60$

$Qs = \quad acfm$

$Qs_{std} = Qs \times 17.647 \times \frac{Ps}{Ts} \times \left(1 - \frac{\% H_2O}{100}\right)$

$Qs_{std} = \quad \times 17.647 \times \frac{}{} \times \left(1 - \frac{}{100}\right)$

$Qs_{std} = \quad dscfm$

Environmental Quality Management, Inc.

GAS VELOCITY AND VOLUMETRIC FLOW RATE

Plant: Scott AFB　　Date: 9/9/03
Sampling Location: Generator - 25% Load　　Clock Time: 0800- 0810
Run #: 25-1　　Operators: TG/RK
Barometric Pressure, in Hg: 30.69　　Static Pressure, in.H_2O: 9.0
Moisture, %: 4%　　Molecular wt., Dry: ______ Pitot Tube, Cp: 0.99
Stack Dimension, in. Diameter or Side 1: 3"　　Side 2: ______
Wet Bulb, °F: ______ Dry Bulb, °F: ______
Pitot # ______ Thermocouple # ______

Condition 2 load 0757- 0800

Traverse Point Number	Velocity Head in.H_2O	Stack Temp, °F
1	6.7	518
2	6.9	524
3	6.9	524
4	6.7	524
5	6.5	522
6	5.8	522
1	6.4	517
2	6.9	525
3	6.8	527
4	6.6	526
5	~~5~~ 5.8	523
6	4.4	529
1	6.4	542
2	6.6	545
3	6.9	547
4	7.0	548
5	7.3	548
6	7.3	547
1	5.7	546
2	6.8	548
3	6.9	548
4	6.9	548
5	7.0	549
6	6.4	545
#1	$\sqrt{\Delta P}$ = 2.519	$\overline{Ts}$ = 523
#2	2.599	547

Condition 2 Run 2 0936- 0943

$Md = (0.44 \times \% CO_2) + (0.32 \times \% O_2) + (0.28 \times \% N_2)$

$Md = (0.44 \times \quad) + (0.32 \times \quad) + (0.28 \times \quad)$

$Md = 29.276$

$Ms = Md \times \left(1 - \frac{\% H_2O}{100}\right) + 18\left(\frac{\% H_2O}{100}\right)$

$Ms = (\quad) \times \left(1 - \frac{}{100}\right) + 18\left(\frac{}{100}\right)$

$Ms = 28.82$

$\overline{Ts} = \quad °F = \quad °R(°F + 460)$

$Ps = Pb + \frac{S.P.}{13.6} = (\quad) + \frac{}{13.6}$

$Ps = 31.35$ in Hg

$\sqrt{\Delta P} =$

$Vs = 85.49 \times Cp \times \sqrt{\Delta P} \times \sqrt{\frac{Ts(°R)}{Ps \times Ms}}$

$Vs = 85.49 \times (\quad) \times (\quad) \times \sqrt{\quad}$

$Vs = 222.4$ ft/s

$As = \quad ft^2$

$Qs = Vs \times As \times 60$

$Qs = \quad \times \quad \times 60$

$Qs = 655$ acfm

$Qs_{std} = Qs \times 17.647 \times \frac{Ps}{Ts} \times \left(1 - \frac{\% H_2O}{100}\right)$

$Qs_{std} = \quad \times 17.647 \times \frac{}{} \times \left(1 - \frac{}{100}\right)$

$Qs_{std} = 354$ dscfm

Static pressure +9.0

area - 0.0873

V_s = 125.0 f/s

ΔP = 2.006

Run 2 static = +2.5"

MD = 29.35
Ms = 29.01
Ps = 31.35
Vs = 231.5
acfm: 681.9
dscfm - 363.4

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130.2 fps
89.057
ΔP = 2.14"

EQ *Environmental Quality Management, Inc*

GAS VELOCITY AND VOLUMETRIC FLOW RATE

Plant: Scott AFB Date: 9/9/03
Sampling Location: -86 Generator Clock Time: 1053 -
Run #: Condition 2, Run 3 Operators: RK / TC
Barometric Pressure, in.Hg: 30.69 Static Pressure, in.H_2O:
Moisture, %: 3 Molecular wt., Dry: Pitot Tube, Cp: 0.99
Stack Dimension, in. Diameter or Side 1: 3" Side 2:
Wet Bulb, °F: — Dry Bulb, °F: —
Pitot # Standard Thermocouple #

Traverse Point Number	Velocity Head in.H_2O	Stack Temp, °F
1	6.8	554
2	6.9	555
3	6.8	555
4	6.5	551
5	6.5	552
6	6.4	551
1	7.1	552
2	6.9	554
3	6.7	553
4	6.5	553
5	6.3	551
6	5.8	550
	$\overline{\sqrt{\Delta P}}$ = 2.56	$\overline{Ts}$ = 553

Avg ΔP = 6.6

$Md = (0.44 \times \% CO_2) + (0.32 \times \% O_2) + (0.28 \times \% N_2)$

$Md = (0.44 \times \quad) + (0.32 \times \quad) + (0.28 \times \quad)$ static

$Md = 29.34$ + 2.5"

$Ms = Md \times \left(1 - \frac{\% H_2O}{100}\right) + 18\left(\frac{\% H_2O}{100}\right)$

$Ms = (\quad) \times \left(1 - \frac{}{100}\right) + 18\left(\frac{}{100}\right)$

$Ms = 28.87$

$\overline{Ts} = \quad °F = \quad °R(°F + 460)$

$Ps = Pb + \frac{S.P.}{13.6} = (\quad) + \frac{}{13.6}$

$Ps = 30.87$ in Hg

$\overline{\sqrt{\Delta P}} =$

$Vs = 85.49 \times Cp \times \overline{\sqrt{\Delta P}} \times \sqrt{\frac{Ts(°R)}{Ps \times Ms}}$

$Vs = 85.49 \times (\quad) \times (\quad) \times \sqrt{\quad}$

$Vs = 231.6$ ft/s 130.2 fps

$As = \quad ft^2$ 90.23

$Qs = Vs \times As \times 60$ ΔP = 2.1"

$Qs = \quad \times \quad \times 60$

$Qs = 6821$ acfm

$Qs_{std} = Qs \times 17.647 \times \frac{Ps}{Ts} \times \left(1 - \frac{\% H_2O}{100}\right)$

$Qs_{std} = \quad \times 17.647 \times \frac{}{} \times \left(1 - \frac{}{100}\right)$

$Qs_{std} = 352.4$ dscfm

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4" = 0.0873 ft²

FIELD DATA SHEET

0.195 K= 1.76

Plant: Scott Air Force Base Sample Type: Methods 5 Operator: MT
Sampling Location: Generator 25% Load Pbar: 30.69 Ps: +9.0
Run Number: 25-1 Date: 9-9-03 CO_2: 4.1 O_2: 15.7
Pretest Leak Rate: .002 cfm @ 13 in.Hg. Probe Length/Type: 3 Ft. Pitot#: 0.99
Pretest Leak Check: Pitot: ✓ Orsat: — Stack Diameter: 4" As: ____

Nozzle ID: ~~[illegible]~~ 0.195 Thermocouple #: ____
Assumed Bws: ___ Filter #: 830572
Meter Box #: 7 Y: 1.006 ΔH@: 1.631
Post-Test Leak Rate: .001/cfm @ 1 in.Hg.
Post-Test Leak Check: Pitot: ✓ Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH Desired	ΔH Actual	Stack Temp (Ts)	Temperature °F Probe	Temperature °F Filter	Impinger Temp. °F	Dry Gas Meter Temp. Tm Inlet	Dry Gas Meter Temp. Tm Outlet	Pump Vacuum (in. Hg)
0	0	08:09	492.250										
1	5	08:14	496.2	2.01	1.9	1.9	523	250	251	62	61	61	1
	10	08:19	499.9	2.01	1.9	1.9	523	250	250	45	63	62	1
	15	08:24	503.8	2.01	1.9	1.9	523	250	251	50	66	62	1
	20	08:29	507.6	2.01	1.9	1.9	523	250	250	52	68	63	1
	25	08:34	511.3	2.01	1.9	1.9	523	250	250	52	71	63	1
	30	08:39	515.1	2.01	1.9	1.9	523	250	251	54	73	64	1
	35	08:44	519.0	2.01	1.9	1.9	523	250	248	55	75	65	1
	40	08:49	522.7	2.01	1.9	1.9	523	250	251	53	76	66	1
	45	08:54	526.5	2.01	1.9	1.9	523	249	250	54	78	67	1
	50	08:59	530.1	2.01	1.9	1.9	523	250	250	54	79	68	1
	55	09:04	534.0	2.01	1.9	1.9	523	250	250	55	80	69	1
	60	09:09	537.861	2.01	1.9	1.9	523	250	250	55	81	70	1

ΔVm = 45.611 ✓ $\overline{\sqrt{\Delta p}}$ = 1.42 ✓ $\overline{\Delta H}$ = 1.9 ✓ $\overline{Ts}$ = 523 ✓ $\overline{Tm}$ = 69 ✓

2.01 ✓

1.4177

KAD 9/10/03

EQ *Environmental Quality Management, Inc.*

SAMPLE RECOVERY DATA

Plant Scott AFB Run No. 25-5-1
Date 9/9/03 Sample Box No. HSB-1 Job No. ______
Sample Location Generator Exhaust Loading - 25 % Filter No. 830572
Train Preparer DA
Sample Recovery Person DA
Comments ______

Front Half

Acetone Container No. ______ Liquid Level Marked ______ Sealed ______

Filter Container No. ______ Sealed ______

Description of Filter Black Loading

Samples Stored and Locked ______

Back Half/Moisture

Container No. ______

Liquid Level Marked ______ Sealed ______

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	DI H2O	100	731.2	777.8	46.6 ✓
2	"	100	709.6	693.2	-16.4 ✓
3	—	—	622.9	626.1	3.2 ✓
4	SG.	250	828.0	842.9	14.9 ✓
5					
6					
Total					48.3 ✓

Description of Impinger Catch: Cloudy

AW 9/16/03

FIELD DATA SHEET

K = 1.45

Plant: Scott Air Force Base Sample Type: methods Operator: mT
Sampling Location: Generator 25% Load Pbar: 30.69 Ps: 9.0
Run Number: 25-2 Date: 9-9-03 CO_2: 4.1 O_2: 15.7
Pretest Leak Rate: .001 cfm @14 in.Hg. Probe Length/Type: 3Ft Pitot#: 0.99
Pretest Leak Check: Pitot: ✓ Orsat: — Stack Diameter: 4" As:

Nozzle ID: 0.183 Thermocouple #:
Assumed Bws: — Filter #: PC026
Meter Box #: 7 Y: 1.006 ΔH@: 1.631
Post-Test Leak Rate: .001 cfm @ 19 in.Hg.
Post-Test Leak Check: Pitot: ✓ Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH Desired	ΔH Actual	Stack Temp (Ts)	Temperature °F Probe	Temperature °F Filter	Impinger Temp. °F	Dry Gas Meter Temp. Tm Inlet	Dry Gas Meter Temp. Tm Outlet	Pump Vacuum (in. Hg)
0	0	09:25	538.125										
1	5	09:30	541.6	2.01	1.6	1.6	523	250	250	66	74	72	2
	10	09:35	545.1	2.01	1.6	1.6	523	260	253	56	78	73	3
	15	09:40	548.5	2.01	1.6	1.6	523	249	251	57	80	74	5
	20	09:45	552.1	2.01	1.6	1.6	523	250	249	59	82	74	6
	25	09:50	555.3	2.01	1.6	1.6	523	250	250	59	83	75	7
	30	09:55	558.8	2.01	1.6	1.6	523	250	250	60	84	76	8
	35	10:00	562.3	2.14	1.7	1.7	523	249	251	58	85	76	14
	40	10:05	565.9	2.14	1.7	1.7	523	250	249	58	85	77	18
	45	10:10	569.6	2.14	1.7	1.7	523	250	250	58	84	78	19
	50	10:15	573.2	2.14	1.7	1.7	523	250	250	61	83	78	19
	55	10:20	576.8	2.14	1.7	1.7	523	251	250	62	82	79	19
	60	10:25	580.3	2.14	1.7	1.7	523	250	250	64	82	79	19

ΔVm = 42.175 $\overline{\sqrt{\Delta p}}$ = 1.4403 ✓ 2.075 ✓ $\overline{\Delta H}$ = 1.645 $\overline{Ts}$ = 523 ✓ $\overline{Tm}$ = 78 ✓

✓ TA 9/16/03

EQ *Environmental Quality Management, Inc.*

SAMPLE RECOVERY DATA

Plant Scott AFB Run No. 25-5-2
Date 9/9/03 Sample Box No. HSB-4 Job No. ____
Sample Location Generator Exhaust- Loading 25% Filter No. PC026
Train Preparer DA
Sample Recovery Person DA
Comments ____

Front Half
Acetone Container No. ____ Liquid Level Marked ____ Sealed ____

Filter Container No ____ Sealed ____

Description of Filter ____

Samples Stored and Locked ____

Back Half/Moisture
Container No. ____

Liquid Level Marked ____ Sealed ____

Imp. No.	Contents	Initial Vol (ml)	Weight (grams) Initial	Final	Net
1	DI H2O	100	710.0	722.1	12.1 ✓
2	DI ~~H2O~~	100	716.8	729.8	13.0 ✓
3	—	—	621.5	623.4	1.9 ✓
4	Silica Gel	250	869.0	886.8	17.8 ✓
5					
6					
Total					44.8 ✓

Description of Impinger Catch: Cloudy

✓ JW 9/16/03

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FIELD DATA SHEET

K= 1.45

Plant: Scott Air Force Base Sample Type: Method 5 Operator: mT
Sampling Location: Generator 25% Load Pbar: 30.69 Ps: 9
Run Number: 25-3 Date: 9-9-03 CO_2: 4.3 O_2: 15.5
Pretest Leak Rate: .002 cfm @ 14 in.Hg. Probe Length/Type: 3 Ft. Pitot#:
Pretest Leak Check: Pitot: ✓ Orsat: – Stack Diameter: As:

Nozzle ID: 0.183 Thermocouple #:
Assumed Bws: Filter #: 830556
Meter Box #: 7 Y: 1.006 ΔH@: 1.631
Post-Test Leak Rate: .009 cfm @ 1 in.Hg.
Post-Test Leak Check: Pitot: ✓ Orsat: –

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH Desired	ΔH Actual	Stack Temp (Ts)	Temperature °F Probe	Temperature °F Filter	Impinger Temp. °F	Dry Gas Meter Temp. Tm Inlet	Dry Gas Meter Temp. Tm Outlet	Pump Vacuum (in. Hg)
0	0	10:42	580.752										
1	5	10:47	584.4	2.14	1.7	1.7	523	251	252	62	81	80	1
	10	10:52	588.2	2.14	1.7	1.7	550	250	252	55	85	81	1
	15	10:57	591.9	2.14	1.7	1.7	550	250	249	57	90	87	1
	20	11:02	595.6	2.14	1.7	1.7	550	251	251	55	92	82	1
	25	11:07	599.3	2.14	1.7	1.7	550	249	250	56	94	83	1
	30	11:12	602.9	2.14	1.7	1.7	552	249	251	55	94	84	1
	35	11:17	606.6	2.14	1.7	1.7	552	250	250	55	95	85	1
	40	11:22	610.3	2.1	1.7	1.7	552	250	250	55	95	85	1
	45	11:27	614.1	2.1	1.7	1.7	552	250	249	56	96	86	1
	50	11:32	617.7	2.1	1.7	1.7	552	251	249	55	96	86	1
	55	11:37	621.4	2.1	1.7	1.7	552	250	250	56	96	87	1
	60	11:42	625.175	2.1	1.7	1.7	552	250	250	56	96	87	1

ΔVm = 44.423 ✓ $\sqrt{\Delta p}$ = 1.46 1.4572 2.12 ✓ $\overline{\Delta H}$ = 1.7 ✓ $\overline{Ts}$ = 549 ✓ $\overline{Tm}$ = 88 ✓

AWT 9/16/03

Environmental Quality Management, Inc.

SAMPLE RECOVERY DATA

Plant Scott AFB Run No. 25-5-3
Date 9/9/03 Sample Box No. HSB-3 Job No.
Sample Location Generator Exhaust - Loading 25% Filter No. 830556
Train Preparer DA
Sample Recovery Person DA
Comments

Front Half
Acetone Container No. Liquid Level Marked Sealed

Filter
Container No. Sealed

Description of Filter Black loading

Samples Stored and Locked

Back Half/Moisture
Container No.

Liquid Level Marked Sealed

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	DI H_2O	100	724.9	814.3	89.4 ✓
2	"	100	719.2	667.7	-51.5 ✓
3	—	—	610.3	610.1	-0.2 ✓
4	SG	250	826.6	840.6	14.0 ✓
5					
6					
Total					51.7 ✓

Description of Impinger Catch: Cloudy

✓ 9/16/03

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Environmental Quality Management, Inc

GAS VELOCITY AND VOLUMETRIC FLOW RATE

Plant: Scott AFB Date: 9/9/03
Sampling Location: ~86 Generator Outlet Clock Time:
Run #: 50-1; 50-2 Operators: RL/TG
Barometric Pressure, in.Hg: 30.69 Static Pressure, in.H_2O:
Moisture, %: 4 Molecular wt., Dry: Pitot Tube, Cp: 0.99
Stack Dimension, in. Diameter or Side 1: 3" Side 2: —
Wet Bulb, °F: Dry Bulb, °F:
Pitot # Thermocouple #

50% setting
Condition 3
Run 1
1154-
1200

Traverse Point Number	Velocity Head in.H_2O	Stack Temp, °F
1	7.8	619
2	7.3	619
3	~~7.3~~ 7.3	620
4	7.4	619
5	6.6	617
6	6.4	614
1	7.8	617
2	7.6	618
3	7.4	619
4	7.1	616
5	6.9	615
6	6.7	613
1	6.9	616
2	7.1	617
3	7.4	620
4	7.5	621
5	7.4	621
6	7.3	619
1	6.9	617
2	6.7	613
3	7.2	616
4	7.7	617
5	7.5	613
6	7.1	608
#1	$\overline{\sqrt{\Delta P}}$ = 2.665	$\overline{Ts}$ = 617
#2	2.687	617

Condition 3
Run 2
1317-

$Md = (0.44 \times \% CO_2) + (0.32 \times \% O_2) + (0.28 \times \% N_2)$

$Md = (0.44 \times \quad) + (0.32 \times \quad) + (0.28 \times \quad)$

$Md =$ 29.4

$Ms = Md \times \left(1 - \frac{\% H_2O}{100}\right) + 18\left(\frac{\% H_2O}{100}\right)$

$Ms = (\quad) \times \left(1 - \frac{}{100}\right) + 18\left(\frac{}{100}\right)$

$Ms =$ 28.94

$\overline{Ts} = \quad °F = \quad °R(°F + 460)$

$Ps = Pb + \frac{S.P.}{13.6} = (\quad) + \frac{}{13.6}$

$Ps =$ 30.95 in Hg

$\overline{\sqrt{\Delta P}} =$

$Vs = 85.49 \times Cp \times \overline{\sqrt{\Delta P}} \times \sqrt{\frac{Ts(°R)}{Ps \times Ms}}$

$Vs = 85.49 \times (\quad) \times (\quad) \times \sqrt{\quad}$

$Vs =$ 247.4 ft/s

$As = \quad ft^2$

$Qs = Vs \times As \times 60$

$Qs = \quad \times \quad \times 60$

$Qs =$ 728.6 acfm

$Qs_{std} = Qs \times 17.647 \times \frac{Ps}{Ts} \times \left(1 - \frac{\% H_2O}{100}\right)$

$Qs_{std} =$ 354.6 $\times 17.647 \times \frac{}{} \times \left(1 - \frac{}{100}\right)$

$Qs_{std} = \quad dscfm$

Static = +3.5"

139.1 fps
92.81
ΔP = 2.25

Static = +3.5"

Environmental Quality Management, Inc

GAS VELOCITY AND VOLUMETRIC FLOW RATE

Plant: Scott AFB Date: 9/9/03
Sampling Location: Clock Time:
Run #: Condition 3 Run 3 Operators: [illegible]/TG
Barometric Pressure, in.Hg: 30.69 Static Pressure, in.H_2O:
Moisture, %: 4 Molecular wt., Dry: Pitot Tube, Cp: 0.99
Stack Dimension, in. Diameter or Side 1: 34 Side 2: —
Wet Bulb, °F: Dry Bulb, °F:
Pitot # Thermocouple #

1431-
1436

Traverse Point Number	Velocity Head in.H_2O	Stack Temp,° F
1	7.3	613
2	7.4	617
3	7.7	616
4	7.6	618
5	7.5	618
6	7.3	615
1	7.0	614
2	7.3	613
3	7.5	617
4	7.4	616
5	7.4	614
6	7.3	614
	$\overline{\sqrt{\Delta P}}=2.72$	$\overline{Ts}=615$

Avg ΔP 7.39

$Md=(0.44\times\%CO_2)+(0.32\times\%O_2)+(0.28\times\%N_2)$

$Md=(0.44\times\ \ )+(0.32\times\ \ )+(0.28\times\ \ )$

$Md=$ 29.4

$Ms=Md\times\left(1-\frac{\%H_2O}{100}\right)+18\left(\frac{\%H_2O}{100}\right)$

Static = +4.0"

$Ms=(\ \ )\times\left(1-\frac{}{100}\right)+18\left(\frac{}{100}\right)$

$Ms=$ 28.94

$\overline{Ts}=\ \ °F=\ \ °R(°F+460)$

$Ps=Pb+\frac{S.P.}{13.6}=(\ \ )+\frac{}{13.6}$

$Ps=$ 30.98 in Hg

$\overline{\sqrt{\Delta P}}=$

$Vs=85.49\times Cp\times\overline{\sqrt{\Delta P}}\times\sqrt{\frac{Ts(°R)}{Ps\times Ms}}$

$Vs=85.49\times(\ \ )\times(\ \ )\times\sqrt{\ \ }$

$Vs=$ 252.0 ft/s

$As=\ \ ft^2$

$Qs=Vs\times As\times60$

$Qs=\ \ \times\ \ \times60$

$Qs=$ 742.1 acfm

$Qs_{std}=Qs\times17.647\times\frac{Ps}{Ts}\times\left(1-\frac{\%H_2O}{100}\right)$

$Qs_{std}=\ \ \times17.647\times\frac{}{}\times\left(1-\frac{}{100}\right)$

$Qs_{std}=$ 362.2 dscfm

\\HAWK\ADMIN\Air Testing\Forms\Field Data Sheets\Gas Velocity and Volumetric Flow Rate doc

FIELD DATA SHEET

1.43
K = 1.45

Plant: Scott Air Force Base Sample Type: method 5 Operator: [illegible]
Sampling Location: Generator 50% Load Pbar: 30.69 Ps: 3.5
Run Number: 50-1 Date: 9-9-03 CO_2: 4.8 O_2: 14.7
Pretest Leak Rate: .002 cfm @ 14 in.Hg. Probe Length/Type: 3 Ft Pitot#: ____
Pretest Leak Check: Pitot: ✓ Orsat: — Stack Diameter: ____ As: ____

Nozzle ID: 0.183 Thermocouple #: ____
Assumed Bws: ____ Filter #: 830557
Meter Box #: 7 Y: 1.006 ΔH@: 1.631
Post-Test Leak Rate: .001 cfm @ 1 in.Hg.
Post-Test Leak Check: Pitot: ✓ Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature °F		Impinger Temp. °F	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter		Inlet	Outlet	
0	0	11:55	625.532										
1	5	12:00	629.2	2.1	1.7	1.7	552	250	253	64	88	87	1
	10	12:05	633.1	2.1	1.7	1.7	552	250	254	60	90	87	1
	15	12:10	636.6	2.1	1.7	1.7	552	251	250	56	91	87	1
	20	12:15	640.3	2.1	1.7	1.7	552	250	250	53	93	87	1
	25	12:20	644.0	2.25	1.6	1.6	617	249	250	53	94	87	1
	30	12:25	647.6	2.25	1.6	1.6	617	249	250	53	94	87	1
	35	12:30	651.2	2.25	1.6	1.6	617	250	250	54	95	87	1
	40	12:35	654.7	2.25	1.6	1.6	617	250	250	55	95	88	1
	45	12:40	658.2	2.25	1.6	1.6	617	249	250	54	95	88	1
	50	12:45	662.0	2.25	1.7	1.7	617	250	250	55	96	88	1
	55	12:50	665.7	2.25	1.7	1.7	617	248	250	55	96	88	1
	60	12:55	669.436	2.25	1.7	1.7	617	251	251	56	97	89	1

ΔVm = 43.904 ✓ $\overline{\sqrt{\Delta p}}$ = 1.4830 / 2.2 ✓ $\overline{\Delta H}$ = 1.66 ✓ $\overline{Ts}$ = ~~617~~ 595 ✓ $\overline{Tm}$ = ~~93~~ 91 ✓

9/10/03

EQ *Environmental Quality Management, Inc.*

SAMPLE RECOVERY DATA

Plant Scott AFB Run No. 50-5-1
Date 9/9/13 Sample Box No. #5B-1 Job No.
Sample Location Generator Exhaust - Loading 50% Filter No. 830557
Train Preparer DA
Sample Recovery Person DA
Comments

Front Half
Acetone Container No. Liquid Level Marked Sealed

Filter Container No. Sealed

Description of Filter Black

Samples Stored and Locked

Back Half/Moisture
Container No.

Liquid Level Marked Sealed

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	DI H2O	100	730.6	800.1	69.5 ✓
2	"	100	708.3	678.8	-29.5 ✓
3	–	–	623.0	623.5	0.5 ✓
4	SG	250	842.9	852.5	9.6 ✓
5					
6					
Total					50.1 ✓

Description of Impinger Catch: Cloudy

✓ 9/16/13

FIELD DATA SHEET

Plant: Scott Air Force Base Sample Type: Method 5 Operator: [illegible]
Sampling Location: Generator 50% Load Pbar: 30.69 Ps: + 3.5
Run Number: 50-2 Date: 9-9-03 CO_2: 4.9 O_2: 14.6
Pretest Leak Rate: .002 cfm @ 14 in.Hg. Probe Length/Type: 3 Ft Pitot#: ____
Pretest Leak Check: Pitot: ✓ Orsat: — Stack Diameter: 4" As: ____

K = .26595
Nozzle ID: 0.120 Thermocouple #: ____
Assumed Bws: ____ Filter #: PC016
Meter Box #: 7 Y: 1.006 ΔH@: 1.631
Post-Test Leak Rate: ____ cfm @ ____ in.Hg.
Post-Test Leak Check: Pitot: ✓ Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH Desired	ΔH Actual	Stack Temp (Ts)	Temperature °F Probe	Temperature °F Filter	Impinger Temp. °F	Dry Gas Meter Temp. Tm Inlet	Dry Gas Meter Temp. Tm Outlet	Pump Vacuum (in. Hg)
0	0	13:10	669.896										
1	5	13:15	671.6	2.25	0.31	0.31	617	247	256	67	91	89	1
	10	13:20	673.2	2.25	0.31	0.31	617	249	252	66	92	89	1
	15	13:25	674.8	2.25	0.31	0.31	617	250	249	66	91	89	1
	20	13:30	676.2	2.25	0.31	0.31	617	249	250	65	91	89	9
	25	13:35	677.3	2.25	0.31	0.31	617	250	251	65	91	89	24
	30	13:40	678.1	2.25	0.31	0.31	617	230	230	65	91	89	25
	35	13:45	678.4	2.25	0.02	0.02	617	250	251	66	90	89	25
	40	13:50	678.8	2.25	0.02	0.02	617	251	250	66	89	89	25
	45	13:55	679.1	2.25	0.61	0.01	617	250	250	66	87	88	26
	50	14:00	679.43	2.25	0.01	0.01	617	250	250	66	88	88	25
	55	14:05	679.66	2.25	0.01	0.01	617	250	250	66	88	88	25
	60	14:10	678.892	2.25	0.01	0.01	617	250	250	67	88	88	25

ΔVm = 8.996 ✓ $\overline{\sqrt{\Delta p}}$ = 1.5000 ✓ $\overline{\Delta H}$ = 0.162 ✓ $\overline{Ts}$ = 617 ✓ $\overline{Tm}$ = 89 ✓

ΔP = 2.25 ✓

9/10/03

EQ *Environmental Quality Management, Inc.*

SAMPLE RECOVERY DATA

Plant Scott AFB Run No. 50-5-2
Date 9/9/03 Sample Box No. #SB-4 Job No. 030174.0006.002
Sample Location Generator Exhaust – 25% Load Filter No. PC016
Train Preparer DA
Sample Recovery Person DA
Comments

Front Half
Acetone Container No. ______ Liquid Level Marked ______ Sealed ______

Filter
Container No. ______ Sealed ______

Description of Filter Light coating – Black

Samples Stored and Locked ______

Back Half/Moisture
Container No. ______

Liquid Level Marked ______ Sealed ______

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	DDH2O	100	718.5	764.9	46.4 ✓
2	"	100	709.2	663.5	-45.7 ✓
3	—	—	621.7	620.4	-1.3 ✓
4	SG	250	886.8	895.9	9.1 ✓
5					
6					
Total					8.5 ✓

Description of Impinger Catch: Cloudy

JD 9/16/03

FIELD DATA SHEET

K = 1.43

Plant: Scott Air Force Base Sample Type: Method 5 Operator: mr
Sampling Location: Generator 50% Load Pbar: 30.69 Ps: +4.0
Run Number: 50-3 Date: 9-9-03 CO_2: 4.7 O_2: 14.5
Pretest Leak Rate: .003 cfm @ 13 in.Hg. Probe Length/Type: 3 Ft Pitot#: ____
Pretest Leak Check: Pitot: ✓ Orsat: — Stack Diameter: ____ As: ____

Nozzle ID: 0.183 Thermocouple #: ____
Assumed Bws: ____ Filter #: 830558
Meter Box #: 7 Y: 1.006 ΔH@: 1.631
Post-Test Leak Rate: .008 cfm @ 2 in.Hg.
Post-Test Leak Check: Pitot: ✓ Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature °F		Impinger Temp. °F	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter		Inlet	Outlet	
0	0	14:24	680.027										
1	5	14:29	683.6	2.25	1.6	1.6	620	232	230	66	88	87	1
	10	14:34	687.2	2.25	1.6	1.6	620	233	234	65	91	88	1
	15	14:39	690.9	2.25	1.6	1.6	620	230	230	60	95	88	1
	20	14:44	694.7	2.25	1.7	1.7	620	230	230	59	98	88	1
	25	14:49	698.4	2.25	1.7	1.7	620	230	231	57	100	89	2
	30	14:54	702.1	2.25	1.7	1.7	620	231	230	58	101	90	2
	35	14:59	705.9	2.25	1.7	1.7	620	231	230	58	101	90	2
	40	15:04	709.7	2.25	1.7	1.7	620	231	230	59	101	91	2
	45	15:09	713.4	2.25	1.7	1.7	620	230	230	59	101	92	2
	50	15:14	717.1	2.25	1.7	1.7	620	230	230	60	101	92	2
	55	15:19	720.9	2.25	1.7	1.7	620	230	230	60	101	92	2
	60	15:24	724.650	2.25	1.7	1.7	620	231	230	60	101	92	2

ΔVm = 44.623 ✓ $\overline{\sqrt{\Delta p}}$ = ~~1.500~~ 2.25 ✓ $\overline{\Delta H}$ = 1.675 ✓ $\overline{Ts}$ = 620 ✓ $\overline{Tm}$ = ~~96.5~~ 94.1 ✓

9/16

Environmental Quality Management, Inc.

SAMPLE RECOVERY DATA

Plant Scott AFB Run No. 50-5-3
Date 9/9/03 Sample Box No. HSB-3 Job No. 030174.0006.002
Sample Location Generator Exhaust - Loading 50% Filter No. 830558
Train Preparer DA
Sample Recovery Person DD
Comments

Front Half
Acetone Container No. Liquid Level Marked Sealed

Filter Container No. Sealed

Description of Filter Blk

Samples Stored and Locked

Back Half/Moisture
Container No.

Liquid Level Marked Sealed

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	DI H_2O	100	734.8	801.0	66.2 ✓
2	"	100	713.8	684.1	-29.7 ✓
3	—	—	609.9	611.0	1.1 ✓
4	SG	250	840.6	849.4	8.8 ✓
5					
6					
Total					46.4 ✓

Description of Impinger Catch: Cloudy

KAD 9/16

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Environmental Quality Management, Inc

GAS VELOCITY AND VOLUMETRIC FLOW RATE

Plant: Scott AFB Date: 9/9/03
Sampling Location: — Ble Bemonstor Clock Time:
Run #: Condition 4 Operators: RK/TG
Barometric Pressure, in.Hg: 30.69 Static Pressure, in.H_2O:
Moisture, %: Molecular wt., Dry: Pitot Tube, Cp: 0.99
Stack Dimension, in. Diameter or Side 1: 3" Side 2: —
Wet Bulb, °F: — Dry Bulb, °F: —
Pitot # Thermocouple #

1605-
1610

Traverse Point Number	Velocity Head in.H_2O	Stack Temp, °F
1	7.9	733
2	8.1	746
3	8.2	747
4	7.7	751
5	7.5	752
6	7.5	750
1	8.3	750
2	8.0	755
3	8.1	755
4	8.0	752
5	7.4	752
6	6.9	751
1	8.3	747
2	8.4	747
3	8.5	750
4	8.1	747
5	7.8	743
6	7.7	742
1	8.0	746
2	8.1	748
3	8.2	748
4	8.0	747
5	7.9	745
6	7.6	744
	$\overline{\sqrt{\Delta P}}$ = 2.79	$\overline{Ts}$ = 750
	7.8	

Condition 4
Run 2
1701-

$Md=(0.44\times\%CO_2)+(0.32\times\%O_2)+(0.28\times\%N_2)$

$Md=(0.44\times\quad)+(0.32\times\quad)+(0.28\times\quad)$

$Md=$

$Ms=Md\times\left(1-\frac{\%H_2O}{100}\right)+18\left(\frac{\%H_2O}{100}\right)$

Static = 5.0"

$Ms=(\quad)\times\left(1-\frac{}{100}\right)+18\left(\frac{}{100}\right)$

$Ms=$ 30.1

$\overline{Ts}=\quad °F=\quad °R(°F+460)$

$Ps=Pb+\frac{S.P.}{13.6}=(\quad)+\frac{}{13.6}$

$Ps=$ 31.06 in Hg

151.1

$\overline{\sqrt{\Delta P}}=$

96.3

$Vs=85.49\times Cp\times\overline{\sqrt{\Delta P}}\times\sqrt{\frac{Ts(°R)}{Ps\times Ms}}$

$Vs=85.49\times(\quad)\times(\quad)\times\sqrt{\quad}$

$Vs=$ 268.8 ft/s

Static = 4.5"

$As=\quad ft^2$

$Qs=Vs\times As\times60$

$Qs=\quad\times\quad\times60$

$Qs=$ 791.7 acfm

$Qs_{std}=Qs\times17.647\times\frac{Ps}{Ts}\times\left(1-\frac{\%H_2O}{100}\right)$

$Qs_{std}=\quad\times17.647\times\frac{}{}\times\left(1-\frac{}{100}\right)$

$Qs_{std}=$ 344.4 dscfm

2.46 ΔP

EQ Environmental Quality Management, Inc.

GAS VELOCITY AND VOLUMETRIC FLOW RATE

Plant: Scott AFB   Date: 9/9/03
Sampling Location: - Bldg Generator Exhaust   Clock Time:
Run #: Condition 4, Run 3   Operators: RK/TO
Barometric Pressure, in.Hg: 30.69   Static Pressure, in.H_2O:
Moisture, %: 4   Molecular wt., Dry: Pitot Tube, Cp: 0.99
Stack Dimension, in. Diameter or Side 1: 3"   Side 2:
Wet Bulb, °F: —   Dry Bulb, °F: —
Pitot #   Thermocouple #

Condition 4
Run 3
1743-
1748

Static = +4.5

Traverse Point Number	Velocity Head in.H_2O	Stack Temp, °F
1	8.4	734
2	8.5	738
3	8.5	740
4	8.3	741
5	8.2	741
6	7.9	742
1	8.3	740
2	8.2	745
3	8.1	746
4	8.1	746
5	8.0	746
6	7.8	745
	$\overline{\sqrt{\Delta P}}$ =	$\overline{Ts}$ =

$Md = (0.44 \times \% CO_2) + (0.32 \times \% O_2) + (0.28 \times \% N_2)$

$Md = (0.44 \times \quad) + (0.32 \times \quad) + (0.28 \times \quad)$

$Md =$

$Ms = Md \times \left(1 - \frac{\% H_2O}{100}\right) + 18\left(\frac{\% H_2O}{100}\right)$

$Ms = (\quad) \times \left(1 - \frac{}{100}\right) + 18\left(\frac{}{100}\right)$

$Ms =$

$\overline{Ts} = \quad °F = \quad °R(°F + 460)$

$Ps = Pb + \frac{S.P.}{13.6} = (\quad) + \frac{}{13.6}$

$Ps = \quad in\ Hg$

$\overline{\sqrt{\Delta P}} =$

$Vs = 85.49 \times Cp \times \overline{\sqrt{\Delta P}} \times \sqrt{\frac{Ts(°R)}{Ps \times Ms}}$

$Vs = 85.49 \times (\quad) \times (\quad) \times \sqrt{\quad}$

$Vs = \quad ft/s$

$As = \quad ft^2$

$Qs = Vs \times As \times 60$

$Qs = \quad \times \quad \times 60$

$Qs = \quad acfm$

$Qs_{std} = Qs \times 17.647 \times \frac{Ps}{Ts} \times \left(1 - \frac{\% H_2O}{100}\right)$

$Qs_{std} = \quad \times 17.647 \times \frac{}{} \times \left(1 - \frac{}{100}\right)$

$Qs_{std} = \quad dscfm$

FIELD DATA SHEET

Plant: Scott Air Force Base Sample Type: Method 5 Operator: [illegible]
Sampling Location: Generator -75% Load Pbar: 30.69 Ps: 45.0
Run Number: 75-1 Date: 9-9-03 CO_2: 6.2 O_2: 12.8
Pretest Leak Rate: .001 cfm @ 14 in.Hg. Probe Length/Type: 3 Ft. Pitot#: -
Pretest Leak Check: Pitot: ✓ Orsat: — Stack Diameter: ______ As: ______

Nozzle ID: 0.183 K = 1.435 Thermocouple #: ______
Assumed Bws: — Filter #: 830559
Meter Box #: 7 Y: 1.006 ΔH@: 1.631
Post-Test Leak Rate: .003 cfm @ 3 in.Hg.
Post-Test Leak Check: Pitot: ✓ Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH Desired	ΔH Actual	Stack Temp (Ts)	Temperature °F Probe	Temperature °F Filter	Impinger Temp. °F	Dry Gas Meter Temp. Tm Inlet	Dry Gas Meter Temp. Tm Outlet	Pump Vacuum (In. Hg)
0	0	15:40	725.048										
1	5	15:45	728.8	2.25	1.7	1.7	620	230	232	63	94	93	2
	10	15:50	732.4	2.25	1.7	1.7	620	239	231	63	95	93	2
	15	15:55	736.2	2.25	1.7	1.7	620	246	230	66	96	92	2
	20	16:00	739.9	2.25	1.7	1.7	620	244	230	65	98	92	2
	25	16:05	743.6	2.25	1.7	1.7	620	241	230	63	99	92	3
	30	16:10	747.4	2.25	1.7	1.7	620	238	230	62	100	92	3
	35	16:15	751.1	2.25	1.7	1.7	620	234	230	62	100	92	3
	40	16:20	754.9	2.25	1.7	1.7	620	234	231	62	100	93	3
	45	16:25	758.6	2.25	1.7	1.7	620	234	230	63	100	93	3
	50	16:30	762.3	2.25	1.7	1.7	620	232	230	63	100	93	3
	55	16:35	766.0	2.25	1.7	1.7	620	232	230	63	100	93	3
	60	16:40	769.696	2.25	1.7	1.7	620	230	230	64	100	93	3

ΔVm = 44.648 ✓ $\overline{\sqrt{\Delta p}}$ = 1.5000 ✓ 2.25 ✓ $\overline{\Delta H}$ = 1.7 ✓ $\overline{Ts}$ = 620 ✓ $\overline{Tm}$ = 95.5 ✓

[illegible] 9/16

EQ Environmental Quality Management, Inc.

SAMPLE RECOVERY DATA

Plant Scott AFB Run No. 75-5-1
Date 9/9/03 Sample Box No. HSB-1 Job No.
Sample Location Generator Exhaust - Loading 75% Filter No. 830559
Train Preparer DA
Sample Recovery Person DA
Comments

Front Half
Acetone Container No. Liquid Level Marked Sealed

Filter
Container No Sealed

Description of Filter Black - Heavy

Samples Stored and Locked

Back Half/Moisture
Container No.

Liquid Level Marked Sealed

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	DIH2O	100	729.8	809.3	79.5 ✓
2	"	"	711.2	679.0	-32.2 ✓
3	—	—	623.1	624.0	0.9 ✓
4	SG.	250	843.1	858.3	15.2 ✓
5					
6					
Total					63.4 ✓

Description of Impinger Catch: Cloudy

✓ [illegible] 9/16

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FIELD DATA SHEET

K = 1.4389

Plant: Scott Air Force Base Sample Type: Method 5 Operator: MT
Sampling Location: Generator - 75% Load Pbar: 30.69 Ps: +5.0
Run Number: 75-2 Date: 9-9-03 CO_2: 6.2 O_2: 12.8
Pretest Leak Rate: .001 cfm @ 14 in.Hg. Probe Length/Type: 3 ft. Pitot#: ___
Pretest Leak Check: Pitot: ✓ Orsat: — Stack Diameter: 4" As: ___

Nozzle ID: 0.183 Thermocouple #: ___
Assumed Bws: ___ Filter #: PC019
Meter Box #: 7 Y: 1.006 ΔH@: 1.631
Post-Test Leak Rate: .002 cfm @ 21 in.Hg.
Post-Test Leak Check: Pitot: ✓ Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature °F		Impinger Temp. °F	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter		Inlet	Outlet	
0	0	16:52	769.932										
1	5	16:57	773.9	2.46	1.6	1.6	750	111	198	66	92	92	1
	10	17:02	776.7	2.46	1.6	1.6	750	183	192	61	94	92	5
End	15	17:07	777.626	2.46	0.33	0.33	750	201	172	60	94	91	23
of Test	20	~~[illegible]~~											
	25												
	30												
	35												
	40												
	45												
	50												
	55												
	60												

ΔVm = 7.694 ✓ $\overline{\sqrt{\Delta p}}$ = 1.5684 ✓ $\overline{\Delta H}$ = 1.18 ✓ $\overline{Ts}$ = 750 ✓ $\overline{Tm}$ = 93 ✓

Δp ~ 2.46 ✓

Environmental Quality Management, Inc.

SAMPLE RECOVERY DATA

Plant Eott AFB Run No. 75-5-2
Date 9/9/03 Sample Box No. HSB-4 Job No. 030174.0006.002
Sample Location Generator Exhaust - Loading - 75% Filter No. PC019
Train Preparer DA
Sample Recovery Person DA/RK
Comments

Front Half
Acetone Container No. ______ Liquid Level Marked ______ Sealed ______

Filter
Container No. ______ Sealed ______

Description of Filter ______

Samples Stored and Locked ______

Back Half/Moisture
Container No. ______

Liquid Level Marked ______ Sealed ______

Imp. No.	Contents	Initial Vol (ml)	Weight (grams) Initial	Final	Net
1	DI H2O	100	708.2	751.1	42.9 ✓
2	DI H2O	100	718.7	677.7	-41.0 ✓
3	empty	NA	621.6	620.4	-1.2 ✓
4	Silica Gel	250	886.4	896.9	10.5 ✓
5					
6					
Total					11.2 ✓

Description of Impinger Catch: ______

✓ 9/16/03

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FIELD DATA SHEET

K = 1.4390

Plant: Scott Air Force Base Sample Type: Method 5 Operator: WT
Sampling Location: Generator – 75% Load Pbar: 30.69 Ps: +5.0
Run Number: 75-3 Date: 9-9-03 CO_2: 6.2 O_2: 12.9
Pretest Leak Rate: .001 cfm @ 14 in.Hg. Probe Length/Type: 3 Ft. Pitot#: ___
Pretest Leak Check: Pitot: ✓ Orsat: — Stack Diameter: ___ As: ___

Nozzle ID: 0.183 Thermocouple #: ___
Assumed Bws: ___ Filter #: 830445
Meter Box #: 7 Y: 1.006 ΔH@: 1.631
Post-Test Leak Rate: .007 cfm @ 1 in.Hg.
Post-Test Leak Check: Pitot: ✓ Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH Desired	ΔH Actual	Stack Temp (Ts)	Temperature °F Probe	Temperature °F Filter	Impinger Temp. °F	Dry Gas Meter Temp. Tm Inlet	Dry Gas Meter Temp. Tm Outlet	Pump Vacuum (in. Hg)
0	0	17:25	777.896										
1	5	17:30	781.5	2.46	1.6	1.6	750	250	250	64	89	89	1
	10	17:35	785.0	2.46	1.6	1.6	750	250	250	60	91	89	1
	15	17:40	788.6	2.46	1.6	1.6	750	250	248	60	94	89	1
	20	17:45	792.2	2.46	1.6	1.6	750	250	253	59	96	89	1
	25	17:50	795.8	2.46	1.6	1.6	750	250	251	58	97	89	1
	30	17:55	799.5	2.46	1.6	1.6	750	250	251	58	97	90	1
	35	18:00	803.0	2.46	1.6	1.6	750	250	250	57	98	90	1
	40	18:05	806.7	2.46	1.6	1.6	750	249	249	57	98	90	1
	45	18:10	810.2	2.46	1.6	1.6	750	250	250	57	98	90	1
	50	18:15	813.8	2.46	1.6	1.6	750	250	250	57	98	90	1
	55	18:20	817.3	2.46	1.6	1.6	750	250	250	57	98	91	1
	60	18:25	820.950	2.46	1.6	1.6	750	251	251	58	98	91	1

ΔVm = 43.054 ✓ $\overline{\sqrt{\Delta p}}$ = 1.5684 ✓ $\overline{\Delta H}$ = 1.6 ✓ $\overline{Ts}$ = 750 ✓ $\overline{Tm}$ = 93 ✓

2.46 ✓

9/16

Environmental Quality Management, Inc.

SAMPLE RECOVERY DATA

Plant Scott AFB Run No. 7-5-3
Date 9/9/03 Sample Box No. HSB-3 Job No.
Sample Location Generator Exhaust - Loading 75% Filter No. 830445
Train Preparer DA
Sample Recovery Person DA
Comments

Front Half
Acetone Container No. Liquid Level Marked Sealed

Filter
Container No. Sealed

Description of Filter Heavy Black

Samples Stored and Locked

Back Half/Moisture
Container No.

Liquid Level Marked Sealed

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	DI H_2O	100	729.4	810.6	81.2 ✓
2	"	100	718.3	682.7	-35.6 ✓
3	—	—	609.9	610.6	0.7 ✓
4	SG	250	840.5	855.3	14.8 ✓
5					
6					
Total					61.1 ✓

Description of Impinger Catch: Cloudy

JAW 9/11/03

Environmental Quality Management, Inc.

GAS VELOCITY AND VOLUMETRIC FLOW RATE

Plant: Scott AFB Date: 9/10/03
Sampling Location: ~86 Generator Exhaust Clock Time:
Run #: Condition 5, Runs 1+2 Operators: RK/TG
Barometric Pressure, in.Hg: 30.68 Static Pressure, in.H_2O:
Moisture, %: 6 Molecular wt., Dry: Pitot Tube, Cp: 0.99
Stack Dimension, in. Diameter or Side 1: 3" Side 2: —
Wet Bulb, °F: — Dry Bulb, °F: —
Pitot # Thermocouple #

Condition 5 Run 1 0828-0835

Traverse Point Number	Velocity Head in.H_2O	Stack Temp, °F
1	8.1	653
2	7.9	664
3	7.8	665
4	7.8	666
5	7.6	666
6	7.3	664
1	7.8	652
2	7.9	654
3	8.0	660
4	8.0	662
5	7.9	663
6	7.9	663
1	7.6	680
2	7.7	685
3	7.5	684
4	6.5	682
5	6.0	680
6	6.7	683
1	7.4	687
2	7.3	687
3	7.2	685
4	6.5	683
5	6.0	683
6	5.9	681
#1	$\overline{\sqrt{\Delta P}}$ = 2.799	$\overline{Ts}$ = 661
#2	2.612	683

Condition 5 Run 2 1000-1007

$$Md = (0.44 \times \% CO_2) + (0.32 \times \% O_2) + (0.28 \times \% N_2)$$

$$Md = (0.44 \times \quad) + (0.32 \times \quad) + (0.28 \times \quad)$$

$Md =$

$$Ms = Md \times \left(1 - \frac{\% H_2O}{100}\right) + 18\left(\frac{\% H_2O}{100}\right)$$

$$Ms = (\quad) \times \left(1 - \frac{}{100}\right) + 18\left(\frac{}{100}\right)$$

$Ms = 28.92$

$\overline{Ts} =$ °F = °R(°F + 460)

$$Ps = Pb + \frac{S.P.}{13.6} = (\quad) + \frac{}{13.6}$$

$Ps = 30.97$ in Hg

$\overline{\sqrt{\Delta P}} =$

$$Vs = 85.49 \times Cp \times \overline{\sqrt{\Delta P}} \times \sqrt{\frac{Ts(°R)}{Ps \times Ms}}$$

$$Vs = 85.49 \times (\quad) \times (\quad) \times \sqrt{\quad}$$

$Vs = 264.9$ ft/s

$As =$ ft²

$Qs = Vs \times As \times 60$

$Qs = \quad \times \quad \times 60$

$Qs = 780.3$ acfm

$$Qs_{std} = Qs \times 17.647 \times \frac{Ps}{Ts} \times \left(1 - \frac{\% H_2O}{100}\right)$$

$$Qs_{std} = \quad \times 17.647 \times \frac{}{} \times \left(1 - \frac{}{100}\right)$$

$Qs_{std} = 365$ dscfm

static = +4.0"
148.9
94.7
ΔP = 2.47

Static = 5.0"

Md = 29.44
Ms = 28.75
Ps = 31.05
Vs = 250.6
acfm = 737.9
dscfm = 332

140.87
95.77
ΔP = 2.16

Environmental Quality Management, Inc.

GAS VELOCITY AND VOLUMETRIC FLOW RATE

Plant: Scott AFB Date: 9/10/03
Sampling Location: Bldg Generator Exhaust Clock Time:
Run #: Condition 5, Run 3 Operators: RK/TG/DA
Barometric Pressure, in.Hg: 30.68 Static Pressure, in.H_2O: +5.5
Moisture, %: Molecular wt., Dry: Pitot Tube, Cp: 0.99
Stack Dimension, in. Diameter or Side 1: 3" Side 2: —
Wet Bulb, °F: — Dry Bulb, °F: —
Pitot # Thermocouple #

1140-
1146

Traverse Point Number	Velocity Head in.H_2O	Stack Temp, °F
1	7.4	690
2	7.6	694
3	7.3	694
4	7.2	693
5	6.8	691
6	7.0	692
1	7.6	692
2	7.6	690
3	7.3	691
4	7.2	688
5	6.7	687
6	5.4	685
	$\sqrt{\Delta P}$ = 2.64	$\overline{Ts}$ = 691

$Md = (0.44 \times \% CO_2) + (0.32 \times \% O_2) + (0.28 \times \% N_2)$

$Md = (0.44 \times \quad) + (0.32 \times \quad) + (0.28 \times \quad)$

$Md =$

$Ms = Md \times \left(1 - \frac{\% H_2O}{100}\right) + 18\left(\frac{\% H_2O}{100}\right)$

$Ms = (\quad) \times \left(1 - \frac{}{100}\right) + 18\left(\frac{}{100}\right)$

$Ms =$ 28.99

$\overline{Ts} =$ °F = °R(°F + 460)

$Ps = Pb + \frac{S.P.}{13.6} = (\quad) + \frac{}{13.6}$

$Ps =$ 31.08 in Hg

$\sqrt{\Delta P} =$

$Vs = 85.49 \times Cp \times \sqrt{\Delta P} \times \sqrt{\frac{Ts(°R)}{Ps \times Ms}}$

$Vs = 85.49 \times (\quad) \times (\quad) \times \sqrt{\quad}$

$Vs =$ 254.7 ft/s

$As =$ ft^2

$Qs = Vs \times As \times 60$

$Qs = \quad \times \quad \times 60$

$Qs =$ 750.2 acfm

$Qs_{std} = Qs \times 17.647 \times \frac{Ps}{Ts} \times \left(1 - \frac{\% H_2O}{100}\right)$

$Qs_{std} = \quad \times 17.647 \times \frac{}{} \times \left(1 - \frac{}{100}\right)$

$Qs_{std} =$ 343.4 dscfm

As = 0.0873

Vs = 143.2 fps

ΔP = 2.24

1.435
K = 1.4396

FIELD DATA SHEET

Plant: Scott Air Force Base Sample Type: Method 5 Operator: MT
Sampling Location: Generator - 100% Load Pbar: 30.68 Ps: +4.0
Run Number: 100-1 Date: 9-10-03 CO_2: 5.7 O_2: 13.6
Pretest Leak Rate: .004 cfm @ 13 in.Hg. Probe Length/Type: 3 Ft Pitot#: ____
Pretest Leak Check: Pitot: ✓ Orsat: — Stack Diameter: ____ As: ____

Nozzle ID: 0.183 Thermocouple #: ____
Assumed Bws: ____ Filter #: 830455
Meter Box #: 7 Y: 1.006 ΔH@: 1.631
Post-Test Leak Rate: .002 cfm @ 1 in.Hg.
Post-Test Leak Check: Pitot: ✓ Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH Desired	ΔH Actual	Stack Temp (Ts)	Temperature °F Probe	Temperature °F Filter	Impinger Temp. °F	Dry Gas Meter Temp. Tm Inlet	Dry Gas Meter Temp. Tm Outlet	Pump Vacuum (in. Hg)
0	0	07:58	821.404										
1	5	08:03	824.9	2.46	1.5	1.5	750	250	249	63	62	61	1
	10	08:08	828.3	2.46	1.5	1.5	750	250	254	49	63	62	1
	15	08:13	831.7	2.46	1.5	1.5	750	250	250	53	65	62	1
	20	08:18	835.2	2.46	1.5	1.5	750	251	245	56	69	63	1
	25	08:23	838.6	2.46	1.5	1.5	750	250	250	55	71	64	1
	30	08:28	842.1	2.46	1.5	1.5	750	250	251	56	73	65	1
	35	08:33	845.6	2.46	1.6	1.6	750	250	251	57	74	66	1
	40	08:38	849.2	2.46	1.6	1.6	750	250	250	58	76	66	1
	45	08:43	852.7	2.46	1.6	1.6	750	251	248	60	77	67	1
	50	08:48	856.4	2.47	1.7	1.7	661	250	249	59	79	68	1
	55	08:53	860.0	2.47	1.7	1.7	661	249	248	59	80	69	1
	60	08:58	863.688	2.47	1.7	1.7	661	250	250	59	81	70	1

ΔVm = 42.285 ✓ $\overline{\sqrt{\Delta p}}$ = 1.57 ✓ 1.5682 ✓ 2.4625 ✓ $\overline{\Delta H}$ = 1.575 ✓ $\overline{Ts}$ = ~~661~~ 728 ✓ TD $\overline{Tm}$ = ~~74.5~~ 68.9 ✓ TD

✓ 9/16

Environmental Quality Management, Inc.

SAMPLE RECOVERY DATA

Plant Scott AFB
Run No. 100-5-1
Date 9/10/03
Sample Box No. HSB-1
Job No. 030174.0006.002
Sample Location Generator Exhaust - load - 100%
Filter No. 830155
Train Preparer DA
Sample Recovery Person DA
Comments

Front Half

Acetone Container No. ______ Liquid Level Marked ______ Sealed ______

Filter Container No. ______ Sealed ______

Description of Filter Black

Samples Stored and Locked ______

Back Half/Moisture

Container No. ______

Liquid Level Marked ______ Sealed ______

Imp. No.	Contents	Initial Vol (ml)	Weight (grams) Initial	Final	Net
1	DI H_2O	100	724.9	788.9	64.0 ✓
2	"	100	721.4	693.9	-27.5 ✓
3	—	—	622.7	627.0	4.3 ✓
4	SG	250	817.0	830.9	13.9 ✓
5					
6					
Total					54.7 ✓

Description of Impinger Catch: Cloudy

✓ DA 9/16

FIELD DATA SHEET

K = 1.435

Plant: Scott Air Force Base Sample Type: method 5 Operator: mT
Sampling Location: Generator - 100% Load Pbar: 30.68 Ps: +4.0
Run Number: 106-2 Date: 9-10-03 CO_2: ____ O_2: ____
Pretest Leak Rate: .002 cfm @ 13 in.Hg. Probe Length/Type: 3 ft Pitot#: ____
Pretest Leak Check: Pitot: ✓ Orsat: — Stack Diameter: ____ As: ____

Nozzle ID: 0.183 Thermocouple #: ____
Assumed Bws: ____ Filter #: PC017
Meter Box #: 7 Y: 1.006 ΔH@: 1.631
Post-Test Leak Rate: .002 cfm @ 25 in.Hg.
Post-Test Leak Check: Pitot: ✓ Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH Desired	ΔH Actual	Stack Temp (Ts)	Temperature °F Probe	Temperature °F Filter	Impinger Temp. °F	Dry Gas Meter Temp. Tm Inlet	Dry Gas Meter Temp. Tm Outlet	Pump Vacuum (in. Hg)
0	0	09:10	863.968										
1	5	09:15	867.6	2.47	1.7	1.7	661			67	73	72	2
	10	09:20	869.8	2.47	1.7	1.7	661			57	78	73	9
	15	09:25	870.719	2.47	0.10	0.10	661			56	77	73	24
	20			2.47	0.02	0.02	661			58	76	73	25
	25												
	30												
	35												
	40												
	45												
	50												
	55												
	60												

End of Test 15 min

ΔVm = 6.751 ✓ $\sqrt{\Delta p}$ = 1.572 ✓ 1.5716 $\overline{\Delta H}$ = 0.88 Dp=2.471 ✓ $\overline{Ts}$ = ~~660~~ 661 ✓ $\overline{Tm}$ = 74 ✓

Environmental Quality Management, Inc.

SAMPLE RECOVERY DATA

Plant Scott AFB Run No. 100-5-2
Date 9/11/03 Sample Box No. HSB-4 Job No. 030174.0006.002
Sample Location - 86 Generator - 100% Load Filter No. PC-017
Train Preparer DL/DA
Sample Recovery Person PA
Comments PS drain

Front Half
Acetone Container No. ______ Liquid Level Marked ______ Sealed ______

Filter Container No. ______ Sealed ______

Description of Filter Black

Samples Stored and Locked ______

Back Half/Moisture
Container No. ______

Liquid Level Marked ______ Sealed ______

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	DI H_2O	100	709.1	710.7	1.6 ✓
2	DI H_2O	100	723.6	722.2	-1.4 ✓
3	—	—	622.3	619.1	-3.2 ✓
4	Silica gel	250 g	896.9	903.2	6.3 ✓
5					
6					
Total					3.3 ✓

Description of Impinger Catch: Cloudy

✓ [initials] 9/16

FIELD DATA SHEET

= 1.4395
K= 1.4355

Plant: Scott Air Force Base Sample Type: Method 5 Operator: mV
Sampling Location: Generator - 100% Load Pbar: 30.68 Ps: +5.0
Run Number: 100-3 Date: 9-10-03 CO_2: 5.8 O_2: 13.4
Pretest Leak Rate: .002 cfm @ 14 in.Hg. Probe Length/Type: 3 Ft. Pitot#:
Pretest Leak Check: Pitot: ✓ Orsat: — Stack Diameter: 4H As:

Nozzle ID: 0.183 Thermocouple #:
Assumed Bws: Filter #: 830502
Meter Box #: 7 Y: 1.006 ΔH@: 1.631
Post-Test Leak Rate: .007 cfm @ 1 in.Hg.
Post-Test Leak Check: Pitot: ✓ Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature °F		Impinger Temp. °F	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter		Inlet	Outlet	
0	0	09:45	870.719										
1	5	09:50	874.3	2.47	1.7	1.7	661	243	238	64	74	74	1
	10	09:55	877.9	2.47	1.7	1.7	661	250	252	58	79	75	1
	15	10:00	881.6	2.47	1.7	1.7	661	250	253	59	84	76	1
	20	10:05	885.3	2.47	1.7	1.7	661	251	250	58	86	77	1
	25	10:10	889.2	2.47	1.7	1.7	661	251	249	59	88	77	1
	30	10:15	893.72	2.16	1.5	1.5	683	249	251	59	89	78	1
	35	10:20	895.93	2.16	1.5	1.5	683	249	251	58	90	79	1
	40	10:25	899.5	2.16	1.5	1.5	683	251	253	58	91	80	1
	45	10:30	903.0	2.16	1.5	1.5	683	251	250	59	91	81	1
	50	10:35	906.4	2.16	1.5	1.5	683	250	251	59	92	82	1
	55	10:40	909.9	2.16	1.5	1.5	683	250	250	60	93	83	1
	60	10:45	913.336	2.16	1.5	1.5	683	249	250	60	93	84	1

ΔVm = 42.617 ✓ $\sqrt{\Delta p}$ = 1.5122 / 2.29 ✓ $\overline{\Delta H}$ = 1.58 ✓ $\overline{Ts}$ = ~~683~~ 674 ✓ $\overline{Tm}$ = ~~87~~ 83 ✓

JKP 9/1/ce

Environmental Quality Management, Inc.

SAMPLE RECOVERY DATA

Plant Scott AFB Run No. 100-5-?
Date 9/10/03 Sample Box No. HSB-3 Job No. 030174.0006.002
Sample Location Generator Exhaust - 100% Load Filter No. 030502
Train Preparer DA
Sample Recovery Person DA
Comments

Front Half
Acetone Container No. ______ Liquid Level Marked ______ Sealed ______

Filter
Container No. ______ Sealed ______

Description of Filter ______

Samples Stored and Locked ______

Back Half/Moisture
Container No. ______

Liquid Level Marked ______ Sealed ______

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	DI H2O	100	733.8	807.6	73.8 ✓
2	"	100	717.2	688.7	-28.5 ✓
3	—	—	610.0	611.0	1.0 ✓
4	SG	250	855.3	864.3	9.0 ✓
5					
6					
Total					55.3 ✓

Description of Impinger Catch: ______

✓ [illegible] 9/16

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FIELD DATA SHEET

K = 1.4361

Plant: Scott Air Force Base Sample Type: Method 5 Operator: [illegible]
Sampling Location: Generator - 100% Load Pbar: 30.68 Ps: +5.0
Run Number: 100-4 Date: 9-10-03 CO_2: 5.7 O_2: 13.5
Pretest Leak Rate: .004 cfm @ 13 in.Hg. Probe Length/Type: 3 Ft. Pitot#: ___
Pretest Leak Check: Pitot: ✓ Orsat: — Stack Diameter: 4" As: ___

Nozzle ID: 0.183 Thermocouple #: ___
Assumed Bws: ___ Filter #: 830532
Meter Box #: 7 Y: 1.006 ΔH@: 1.631
Post-Test Leak Rate: .001 cfm @ 1 in.Hg.
Post-Test Leak Check: Pitot: ✓ Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH Desired	ΔH Actual	Stack Temp (Ts)	Temperature °F Probe	Temperature °F Filter	Impinger Temp. °F	Dry Gas Meter Temp. Tm Inlet	Dry Gas Meter Temp. Tm Outlet	Pump Vacuum (in. Hg)
0	0	10:58	913.648										
1	5	11:03	917.0	2.16	1.5	1.5	683	248	251	67	86	85	1
	10	11:08	920.6	2.16	1.5	1.5	683	250	254	67	89	85	1
	15	11:13	924.0	2.16	1.5	1.5	683	250	251	62	91	85	1
	20	11:18	927.6	2.16	1.5	1.5	683	250	250	59	92	86	1
	25	11:23	931.1	2.16	1.5	1.5	683	251	249	57	93	86	1
	30	11:28	934.6	2.16	1.5	1.5	683	250	251	58	94	86	1
	35	11:33	938.1	2.16	1.5	1.5	683	250	248	58	95	87	1
	40	11:38	941.7	2.16	1.5	1.5	683	250	251	59	95	87	1
	45	11:43	945.2	2.16	1.5	1.5	683	249	250	60	96	88	1
	50	11:48	948.7	2.16	1.5	1.5	683	250	250	60	96	88	1
	55	11:53	952.3	2.16	1.5	1.5	683	251	250	60	96	88	1
	60	11:58	955.844	2.16	1.5	1.5	683	250	249	60	96	88	1

ΔVm = 42.196 ✓ $\sqrt{\Delta p}$ = 1.47 ✓ 1.4697 ✓ 2.16 ✓ $\overline{\Delta H}$ = 1.5 ✓ $\overline{Ts}$ = 683 ✓ $\overline{Tm}$ = ~~92~~ 89.9 ✓

✓ [illegible]

Environmental Quality Management, Inc.

SAMPLE RECOVERY DATA

Plant Scott AFB
Run No. 100-5-4
Date 9/10/03
Sample Box No. HSB-1
Job No. 030174.0006.002
Sample Location Generator Exhaust - Loading 100%
Filter No. 830532
Train Preparer DA
Sample Recovery Person DA
Comments

Front Half

Acetone Container No. ______ Liquid Level Marked ______ Sealed ______

Filter Container No. ______ Sealed ______

Description of Filter Black

Samples Stored and Locked ______

Back Half/Moisture

Container No. ______

Liquid Level Marked ______ Sealed ______

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	DI H2O	100	736.7	805.8	69.1 ✓
2	"	100	706.1	682.6	-23.5 ✓
3	—	—	622.5	622.9	0.4 ✓
4	SG	250	830.9	839.9	9.0 ✓
5					
6					
Total					55.0 ✓

Description of Impinger Catch: Cloudy

✓ HD 9/16/03

Environmental Quality Management, Inc

EPA METHOD 30
VOLATILE ORGANIC SAMPLING TRAIN (VOST) SAMPLING DATA

Company: Scott AFB
Date: 9/8/03
Time:
Meter #: VB-1
Barometric Pressure, in.Hg: 30.65
Ambient Temperature, °F:

City: O'Fallon Illinois
Location: T-86 Generator
Run #: 0030-1
Y-Factor:
Operator: [illegible]
Purge Time:

Vacuum Leak Check Data

	Initial, in.Hg	Final, in.Hg	Time, min.
Pre-test:	~~[illegible]~~ 25.0	25.0	2.0
Post-test:			

9/8/03
Condition 1

9/9/03
Condition 2

Condition 3
9/9/03

Condition 4
9/9/03
Start at 1538

Sample Time (min)	Clock Time, (24-hr)	Meter Volume, (liter)	Rotameter Setting	Dry Gas Meter Temp., (°F)	Vacuum, (in.Hg)	Probe Temp, °F
0	1531	9822.85	0.25	85/85	1	250
5	1536	9823.5	0.25	84/85	1	250
10	1541	9824.20	0.25	85/85	1	250
Initial Vm	0823	9824.49				
12.5	0825	9824.8	0.25	70/68	1	250
15.0	0827	9825.1	0.25	71/70	1	250
17.5	0830	9825.5	0.25	72/72	1	250
20.0	0833	9826.20	0.25	72/72	1	250
	1215					
25.	1220	9827.5	0.25	96/96	1	250
30	1225	9829.0	0.25	97/97	1	250
35	1543	9830.0	0.25	86/87	1	250
40	1548	9831.0	0.25	86/87	1	250

Nitrogen purge/activated carbon packing in sample holding container:

$$V_{std} = V_m\,(\text{liters}) \times Y \times 17.647 \times \frac{P_b\,(\text{in.Hg})}{T_m\,(^\circ R)}$$

V_{std}

Environmental Quality Management, Inc

page 2

EPA METHOD 30
VOLATILE ORGANIC SAMPLING TRAIN (VOST) SAMPLING DATA

Company: Scott AFB
Date: 9/10/03
Time:
Meter #: VB-1
Barometric Pressure, in.Hg: 30.60
Ambient Temperature, °F:

City: OFallon Illinois
Location: -86 Generator
Run #: 0030-1
Y-Factor:
Operator:
Purge Time:

Vacuum Leak Check Data

	Initial, in.Hg	Final, in.Hg	Time, min.
Pre-test:			
Post-test:			

Sample Time (min)	Clock Time, 0812 (24-hr)	Meter Volume, (liter)	Rotameter Setting	Dry Gas Meter Temp., (°F)	Vacuum, (in.Hg)	Probe Temp, °F
40	~~9831.0~~	9831.0	0.25	68/68	1	250
45	0817	9832.0	0.25	68/68	1	250
50	0822	9833.42	0.250	69/69	1	250

Nitrogen purge/activated carbon packing in sample holding container: ____________

$$V_{std} = V_m\,(\text{liters}) \times Y \times 17.647 \times \frac{P_b\,(\text{in.Hg})}{T_m\,(^\circ R)}$$

V_{std}

EQ Environmental Quality Management, Inc

PAH

EPA METHOD ~~30~~
VOLATILE ORGANIC SAMPLING TRAIN (VOST) SAMPLING DATA

Company: Scott AFB
Date: 9/8/03
Time:
Meter #: VB-2
Barometric Pressure, in.Hg: 30.65
Ambient Temperature, °F:

City: O'Fallon Illinois
Location: -86 Garden
Run #: 5515-1
Y-Factor:
Operator: [illegible]
Purge Time: —

Vacuum Leak Check Data

	Initial, in.Hg	Final, in.Hg	Time, min.
Pre-test:	25.0	25.0	2
Post-test:			

9/8/03 10%

9/9/03 Condition 2

9/9/03 Condition 3

Condition 4 Start at 1538

Sample Time (min)	Clock Time, (24-hr)	Meter Volume, (liter)	Rotameter Setting	Dry Gas Meter Temp., (°F)	Vacuum, (in.Hg)	Probe Temp, °F
0	1531	5521.94	0.25	85/85	1	NA
5	1536	5522.6	0.25	87/84	1	NA
10	1541	5523.50	0.25	87/85	1	N/A
Initial Vm	0823	5523.54	0.			
12.5	0825	5523	0.25	68/66	1	N/A
15.0	0827	5524.3	0.25	69/67	1	N/A
17.5	0830	5525.3	0.25	71/67	1	N/A
20.0	0833	5526.25	0.25	71/68	1	N/A
	1215					
25	1220	5527.3	0.25	95/93	1	N/A
30	1225	5528.6	0.25	97/94	1	N/A
35	1543	5529.9	0.25	88/86	1	N/A
40	1548	5531.12	0.25	89/86	1	N/A

Nitrogen purge/activated carbon packing in sample holding container: ______

$$V_{std} = V_m\,(\text{liters}) \times Y \times 17.647 \times \frac{P_b(\text{in.Hg})}{T_m(^\circ R)}$$

V_{std}

Environmental Quality Management, Inc

page 2

PAH

EPA METHOD ~~30~~
VOLATILE ORGANIC SAMPLING TRAIN (VOST) SAMPLING DATA

Company: Scott AFB
Date: 9/10/03
Time:
Meter #: VB-2
Barometric Pressure, in.Hg: 30.68
Ambient Temperature, °F:

City: O'Fallon Illinois
Location: ~86 [illegible]
Run #: 5515-1
Y-Factor:
Operator: RK
Purge Time:

Vacuum Leak Check Data

	Initial, in.Hg	Final, in.Hg	Time, min.
Pre-test:			
Post-test:			

Sample Time (min)	Clock Time, (24-hr)	Meter Volume, (liter)	Rotameter Setting	Dry Gas Meter Temp., (°F)	Vacuum, (in.Hg)	Probe Temp, °F
40	0812	5531.12	0.25	67/67	1	N/A
45	0817	5532.4	0.25	69/66	1	N/A
50	0822	5533.76	0.25	69/67	1	N/A

Nitrogen purge/activated carbon packing in sample holding container: ______

$$V_{std} = V_m\,(\text{liters}) \times Y \times 17.647 \times \frac{P_b\,(\text{in.Hg})}{T_m\,(^\circ R)}$$

V_{std}

K = 1.725
Glass

FIELD DATA SHEET

Plant: Scott AFB
Sampling Location: ~86 generator
Run Number: 001-1 Date: 9/8/03
Pretest Leak Rate: 0.005 cfm @ 15 in.Hg.
Pretest Leak Check: Pitot: ✓ Orsat: —

Sample Type: Aldehydes/Ketones Operator: RK
Pbar: 30.65 Ps: 7.3
CO_2: ______ O_2: ______
Probe Length/Type: 2' Glass Pitot#: ______
Stack Diameter: 4" As: ______

Nozzle ID: 0.193 Thermocouple #: ______
Assumed Bws: 3 Filter #: N/A
Meter Box #: 8 Y: 1.003 ΔH@: 1.547
Post-Test Leak Rate: ____ cfm @ ____ in.Hg.
Post-Test Leak Check: Pitot: ______ Orsat: ✓

	Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH Desired	ΔH Actual	Stack Temp (Ts)	Temperature °F Probe	Temperature °F Filter	Impinger Temp. °F	Dry Gas Meter Temp. Tm Inlet	Dry Gas Meter Temp. Tm Outlet	Pump Vacuum (in. Hg)
9/8/03		0	1520	517.765										
10% Condition		2.5	1523	519.7	1.61	1.99	1.99	300	250	230	63	85	85	1
		5.0	1525	522.1	1.61	1.99	1.99	300	253	238	59	82	85	1
		7.5	1527	523.9	1.61	1.99	1.99	300	251	249	56	83	85	1
		10.0	1530	525.764	1.61	1.99	1.99	300	249	253	57	84	85	1
Condition 2 9/9/03	Leak check			525.979	~~2.01~~									
		10.0	0810	525.979	2.01	1.84	1.84	524	252	251	61	63	62	1
		12.5	0813	527.8	2.01	1.84	1.84	524	254	249	52	62	62	1
		15.0	0815	529.7	2.01	1.84	1.84	524	251	252	45	63	62	1
		17.5	0817	531.6	2.01	1.84	1.84	524	251	253	46	65	63	1
		20.0	0820	533.608	2.01	1.84	1.84	524	252	251	47	66	63	1
			1203											
Condition 3 9/9/03		22.5	1206	535.7	2.1	1.9	1.9	552	251	253	60	90	92	1
		25.0	1208	537.4	2.1	1.9	1.9	552	251	251	58	90	92	1
		27.5	1211	—	2.1	1.9	1.9	552	251	251	57	91	92	1
		30.0	1213	541.405	2.1	1.9	1.9	552	251	250	55	91	92	1
			1550											
Condition 4		32.5	1552	543.3	2.25	1.7	1.7	620	256	251	67	84	85	1
		35.0	1555	544.9	2.25	1.7	1.7	620	256	250	56	85	85	1
		37.5	1557	547.15	2.25	1.7	1.7	620	250	251	49	84	84	1
		40.0	1600	548.805	2.25	1.7	1.7	620	250	251	49	84	84	1
Condition 5 9/10/03		Initial	0800	549.115										
		42.5	0803	551.0	2.25	1.8	1.8	750	250	251	63	64	63	1
		45.0	0805	553.1	2.25	1.8	1.8	750	253	251	51	63	63	1
		47.5	0807	555.0	2.25	1.8	1.8	750	250	251	47	65	63	1
		50.0	0810	556.673	2.25		1.8		249	251	45	66	64	1

ΔVm = ______ $\sqrt{\Delta p}$ = 1.424 ✓ $\overline{\Delta H}$ = 1.85 ✓ $\overline{Ts}$ = 540 ✓ $\overline{Tm}$ = 77 ✓

EQ *Environmental Quality Management, Inc.*

SAMPLE RECOVERY DATA

Plant Scott AFB Run No. 0011-1
Date 9/8/03 - 9/10/03 Sample Box No. SB-3 Job No. 020124.0006.002
Sample Location — 96 Generator Filter No. NA
Train Preparer NT / NT
Sample Recovery Person DA / RC
Comments METHYLENE CHLORIDE RINSED

Front Half
Acetone
Container No. ________ Liquid Level Marked ______ Sealed ________

Filter
Container No. ________ Sealed ________

Description of Filter ________

Samples Stored and Locked ________

Back Half/Moisture
Container No. ________

Liquid Level Marked ________ Sealed ________

Imp. No.	Contents	Initial Vol (ml)	Weight (grams) Initial	Final	Net
1	DNPH	100	719.0	751.3	32.3 ✓
2	DNPH	100	731.4	737.8	6.4 ✓
3	DNPH	100	716.8	717.0	0.2 ✓
4	Silica Gel	250	842.0	849.8	7.8 ✓
5					
6					
Total					46.7 ✓

Description of Impinger Catch: ________

✓ 9/16

MF2 LIGHTING UNIT GENERATOR

Environmental Quality Management, Inc

GAS VELOCITY AND VOLUMETRIC FLOW RATE

Plant: Scott AFB Date: 9/10/03
Sampling Location: ~MF2 Exhaust Clock Time:
Run #: Condition 1, Runs 1 & 2 Operators: RK/TG
Barometric Pressure, in.Hg: 30.68 Static Pressure, in.H_2O:
Moisture, %: Molecular wt., Dry: Pitot Tube, Cp: 0.99
Stack Dimension, in. Diameter or Side 1: 3" Side 2:
Wet Bulb, °F: — Dry Bulb, °F: —
Pitot # Thermocouple #

V_{s1} = 14.08 ACFm = 41.5
P_{s1} = 30.69 dscfm
M_{s1} = 28.98 30.1

A_s = 0.0873

V_s = 7.92

$\sqrt{\Delta P}$ = 0.104

ΔP = 0.0108

D_N = 0.495
K = 77.59

Condition 1 Run 1 1250 -
P_s + 0.01
ΔP = 0.0342
$\sqrt{\Delta P}$ = 0.1845
T_s = 263

Traverse Point Number	Velocity Head in.H_2O	Stack Temp, ° F
1	0.04	211
2	0.04	241
3	0.04	257
4	0.035	261
5	0.03	271
6	0.03	270
1	0.03	258
2	0.035	265
3	0.035	272
4	0.03	277
5	0.03	280
6	0.035	281
1	0.04	264
2	0.04	262
3	0.04	270
4	0.035	281
5	0.03	293
6	0.03	302
1	0.035	268
2	0.035	291
3	0.03	305
4	0.03	308
5	0.03	309
6	0.035	309
	$\overline{\sqrt{\Delta P}}$ = 0.185	$\overline{Ts}$ = 289

Condition 1 Run 2

+0.01

$$Md = (0.44 \times \% CO_2) + (0.32 \times \% O_2) + (0.28 \times \% N_2)$$ (4.5, 15.4, 80.1)

$$Md = (0.44 \times \quad) + (0.32 \times \quad) + (0.28 \times \quad)$$

$$Md = 29.336$$

$$Ms = Md \times \left(1 - \frac{\% H_2O}{100}\right) + 18\left(\frac{\% H_2O}{100}\right)$$

$$Ms = (29.336) \times \left(1 - \frac{3.5}{100}\right) + 18\left(\frac{3.5}{100}\right)$$

$$Ms = 28.94$$

$$\overline{Ts} = 289 \ ^\circ F = 749 \ ^\circ R(^\circ F + 460)$$

$$Ps = Pb + \frac{S.P.}{13.6} = (30.68) + \frac{+0.01}{13.6}$$

$$Ps = 30.68 \ in \ Hg$$

$$\overline{\sqrt{\Delta P}} = 0.185$$

$$Vs = 85.49 \times Cp \times \overline{\sqrt{\Delta P}} \times \sqrt{\frac{Ts(^\circ R)}{Ps \times Ms}}$$

$$Vs = 85.49 \times (0.99) \times (0.185) \times \sqrt{\frac{749}{30.68 \times 28.94}}$$

$$Vs = 14.38 \ ft/s$$

$$As = 0.049 \ ft^2 \quad \pi r^2$$

$$Qs = Vs \times As \times 60$$

$$Qs = \quad \times \quad \times 60$$

$$Qs = 42.33 \ acfm$$

$$Qs_{std} = Qs \times 17.647 \times \frac{Ps}{Ts} \times \left(1 - \frac{\% H_2O}{100}\right)$$

$$Qs_{std} = 42.33 \times 17.647 \times \frac{30.68}{749} \times \left(1 - \frac{3.5}{100}\right)$$

$$Qs_{std} = 29.53 \ dscfm$$

EQ *Environmental Quality Management, Inc.*

GAS VELOCITY AND VOLUMETRIC FLOW RATE

Plant: Scott AFB Date: 9/10/03
Sampling Location: MF2 Exhaust Clock Time: 1601-1606
Run #: Condition 1, Run 3 Operators: AK/TG
Barometric Pressure, in.Hg: 30.68 Static Pressure, in.H_2O: ______
Moisture, %: ______ Molecular wt., Dry: ______ Pitot Tube, Cp: 0.99
Stack Dimension, in. Diameter or Side 1: 3" Side 2: —
Wet Bulb, °F: — Dry Bulb, °F: —
Pitot # ______ Thermocouple # ______

Traverse Point Number	Velocity Head in.H_2O	Stack Temp,° F
1	0.004	271
2	0.0035	279
3	0.0035	282
4	0.0035	293
5	0.035	302
6	0.035	307
1	0.030	299
2	0.035	304
3	0.035	307
4	0.04	290
5	0.04	265
6	0.04	260
	$\sqrt{\overline{\Delta P}}$ =	$\overline{Ts}$=

$Md = (0.44 \times \% CO_2) + (0.32 \times \% O_2) + (0.28 \times \% N_2)$

$Md = (0.44 \times \quad) + (0.32 \times \quad) + (0.28 \times \quad)$

$Md =$

Static = +0.01

$Ms = Md \times \left(1 - \frac{\% H_2O}{100}\right) + 18\left(\frac{\% H_2O}{100}\right)$

$Ms = (\quad) \times \left(1 - \frac{\quad}{100}\right) + 18\left(\frac{\quad}{100}\right)$

$Ms =$

$\overline{Ts} = \quad °F = \quad °R(°F + 460)$

$Ps = Pb + \frac{S.P.}{13.6} = (\quad) + \frac{\quad}{13.6}$

$Ps = \quad in\ Hg$

$\sqrt{\overline{\Delta P}} =$

$Vs = 85.49 \times Cp \times \sqrt{\overline{\Delta P}} \times \sqrt{\frac{Ts(°R)}{Ps \times Ms}}$

$Vs = 85.49 \times (\quad) \times (\quad) \times \sqrt{\quad}$

$Vs = \quad ft/s$

$As = \quad ft^2$

$Qs = Vs \times As \times 60$

$Qs = \quad \times \quad \times 60$

$Qs = \quad acfm$

$Qs_{std} = Qs \times 17.647 \times \frac{Ps}{Ts} \times \left(1 - \frac{\% H_2O}{100}\right)$

$Qs_{std} = \quad \times 17.647 \times \frac{\quad}{\quad} \times \left(1 - \frac{\quad}{100}\right)$

$Qs_{std} = \quad dscfm$

FIELD DATA SHEET

Plant: Scott Air Force Base Sample Type: Method 5 Operator: MT
Sampling Location: Lights
Run Number: L-1 Date: 9-10-03
Pretest Leak Rate: .005 cfm @ 14 in.Hg.
Pretest Leak Check: Pitot: ✓ Orsat: —

Pbar: 30.68 Ps: +0.01
CO_2: 4.4 O_2: 15.2
Probe Length/Type: 3 Ft. Pitot#: 0.99
Stack Diameter: 3" As:

Nozzle ID: 0.495 K=77.59 Thermocouple #:
Assumed Bws: — Filter #: 830533
Meter Box #: 7 Y: 1.006 ΔH@: 1.631
Post-Test Leak Rate: .005 cfm @ 2 in.Hg.
Post-Test Leak Check: Pitot: ✓ Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH Desired	ΔH Actual	Stack Temp (Ts)	Temperature °F Probe	Temperature °F Filter	Impinger Temp. °F	Dry Gas Meter Temp. Tm Inlet	Dry Gas Meter Temp. Tm Outlet	Pump Vacuum (in. Hg)
0	0	13:13	956.136										
1	5	13:18	958.5	0.0108	0.64	0.64	263	249	254	67	88	88	1
	10	13:23	960.9	0.0108	0.64	0.64	263	250	250	62	88	88	1
	15	13:28	963.3	0.0108	0.64	0.64	263	249	250	63	89	88	1
	20	13:33	965.7	0.0108	0.64	0.64	263	250	250	60	90	88	1
	25	13:38	968.1	0.0108	0.64	0.64	263	250	250	57	91	88	1
	30	13:43	970.5	0.0108	0.64	0.64	263	250	250	56	92	88	1
	35	13:48	973.2	0.0108	0.64	0.64	263	250	249	56	93	89	1
	40	13:53	975.1	0.0108	0.64	0.64	263	250	249	55	94	89	1
	45	13:58	977.7	0.0108	0.64	0.64	263	250	249	55	94	89	2
	50	14:03	980.1	0.0108	0.64	0.64	263	251	251	55	95	90	2
	55	14:08	982.6	0.0108	0.64	0.64	263	251	250	55	95	90	2
	60	14:13	985.008	0.0108	0.64	0.64	263	250	250	55	96	91	2

ΔVm = 28.872 ✓ $\sqrt{\Delta p}$ = 0.1039 ✓ 0.0108 ✓ $\overline{\Delta H}$ = 0.64 ✓ $\overline{Ts}$ = 263 ✓ $\overline{Tm}$ = ~~93.5~~ 90.5 ✓

9/16/03

Environmental Quality Management, Inc.

SAMPLE RECOVERY DATA

Plant Scott AFB Run No. LC-1
Date 9/10/03 Sample Box No. HSB-4 Job No.
Sample Location Light Generator Filter No. 820533
Train Preparer DA
Sample Recovery Person DA
Comments

Front Half
Acetone
Container No. Liquid Level Marked Sealed

Filter
Container No. Sealed

Description of Filter Solid Black

Samples Stored and Locked

Back Half/Moisture
Container No.

Liquid Level Marked Sealed

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	DI H₂O	100	708.6	752.5	43.9 ✓
2	"	100	725.9	704.9	-21.0 ✓
3	—	—	620.8	619.6	-1.2 ✓
4	SG	250	903.2	903.1	-0.1 ✓
5					
6					
Total					216 ✓

Description of Impinger Catch: Yellow, Cloudy

DA 9/11/03

FIELD DATA SHEET

Plant: Scott Air Force Base Sample Type: Method 5 Operator: MT
Sampling Location: Lights
Run Number: L-2 Date: 9-10-03
Pretest Leak Rate: .001 cfm @ 14 in.Hg.
Pretest Leak Check: Pitot: ✓ Orsat: —

Pbar: 30.68 Ps: +0.01
CO_2: 4.5 O_2: 15.4
Probe Length/Type: 3 ft. Pitot#: 0.99
Stack Diameter: 3" As:

K = 77.59
Nozzle ID: 0.495 Thermocouple #:
Assumed Bws: Filter #: 830527
Meter Box #: 7 Y: 1.006 ΔH@: 1.631
Post-Test Leak Rate: .005 cfm @ 2 in.Hg.
Post-Test Leak Check: Pitot: ✓ Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature °F		Impinger Temp. °F	Dry Gas Meter Temp: Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter		Inlet	Outlet	
0	0	14:29	986.150										
1	5	14:34	988.6	0.0108	0.64	0.64	263	250	252	67	93	91	1
	10	14:39	991.0	0.0108	0.64	0.64	263	250	252	67	93	91	1
	15	14:44	993.4	0.0108	0.64	0.64	263	252	251	65	94	91	1
	20	14:49	995.8	0.0108	0.64	0.64	263	251	250	60	95	92	1
	25	14:54	998.3	0.0108	0.64	0.64	263	249	250	59	96	92	1
	30	14:59	1000.7	0.0108	0.64	0.64	263	250	250	57	96	92	1
	35	15:04	1003.1	0.0108	0.64	0.64	263	249	250	57	97	92	1
	40	15:09	1005.5	0.0108	0.64	0.64	263	250	250	57	97	92	1
	45	15:14	1008.0	0.0108	0.64	0.64	263	252	250	57	97	93	1
	50	15:19	1010.3	0.0108	0.64	0.64	263	250	250	57	97	93	2
	55	15:24	1013.2	0.0108	0.64	0.64	263	249	250	57	97	93	2
	60	15:29	1015.145	0.0108	0.64	0.64	263	250	250	57	98	93	2

ΔVm = 28.995 ✓ $\sqrt{\Delta p}$ = 0.1039 ✓ 0.0108 ✓ $\overline{\Delta H}$ = 0.64 ✓ $\overline{Ts}$ = 263 ✓ $\overline{Tm}$ = ~~93~~ 94 ✓

KV 9/11/02

Environmental Quality Management, Inc.

SAMPLE RECOVERY DATA

Plant Scott AFB Run No. L-5-2
Date 9/10/03 Sample Box No. HSB-3 Job No.
Sample Location Light Generator Filter No. 830527
Train Preparer DA
Sample Recovery Person DA
Comments

Front Half
Acetone Container No. Liquid Level Marked Sealed

Filter
Container No. Sealed

Description of Filter Solid Black

Samples Stored and Locked

Back Half/Moisture
Container No.

Liquid Level Marked Sealed

Imp. No.	Contents	Initial Vol (ml)	Weight (grams)		
			Initial	Final	Net
1	DI H_2O	100	734.5	788.1	53.6 ✓
2	"	100	715.1	683.7	-31.4 ✓
3	—	—	610.6	609.6	-1.0 ✓
4	SG	250	834.2	847.0	12.8 ✓
5					
6					
Total					34.0 ✓

Description of Impinger Catch: Yellow, Cloudy

DA 9/10

N:\Forms\Forms\Emission Testing\Sample Recovery Data.doc

FIELD DATA SHEET

K = 77.59

Plant: Scott Air Force Base Sample Type: Method 5 Operator: [illegible]
Sampling Location: Lights Pbar: 30.68 Ps: +0.01
Run Number: 2-3 Date: 9-10-03 CO_2: 4.4 O_2: 15.4
Pretest Leak Rate: .003 cfm @ 12 in.Hg. Probe Length/Type: 3 Ft. Pitot#: 0.99
Pretest Leak Check: Pitot: ✓ Orsat: — Stack Diameter: 3" As:

Nozzle ID: 0.495 Thermocouple #:
Assumed Bws: Filter #: PC013
Meter Box #: 7 Y: 1.006 ΔH@: 1.631
Post-Test Leak Rate: .001 cfm @ 2 in.Hg.
Post-Test Leak Check: Pitot: ✓ Orsat: —

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH Desired	ΔH Actual	Stack Temp (Ts)	Temperature °F Probe	Temperature °F Filter	Impinger Temp. °F	Dry Gas Meter Temp. Tm Inlet	Dry Gas Meter Temp. Tm Outlet	Pump Vacuum (In. Hg)
0	0	15:42	015.480										
1	5	15:47	017.9	0.0108	0.64	0.64	263	248	251	66	93	93	1
	10	15:52	020.3	0.0108	0.64	0.64	263	250	253	66	95	93	1
	15	15:57	022.6	0.0108	0.64	0.64	263	250	249	62	96	93	1
	20	16:02	024.9	0.0108	0.64	0.64	263	250	250	61	96	93	1
	25	16:07	027.4	0.0108	0.64	0.64	263	251	250	60	97	93	1
	30	16:12	029.8	0.0108	0.64	0.64	263	250	251	59	97	93	1
	35	16:17	032.2	0.0108	0.64	0.64	263	250	250	59	98	94	1
	40	16:22	034.6	0.0108	0.64	0.64	263	250	251	59	98	94	1
	45	16:27	037.1	0.0108	0.64	0.64	263	250	249	59	99	94	2
	50	16:32	039.5	0.0108	0.64	0.64	263	251	250	59	99	94	2
	55	16:37	041.9	0.0108	0.64	0.64	263	250	249	59	99	94	2
	60	16:42	044.324	0.0108	0.64	0.64	263	249	249	59	99	94	2

ΔVm = 28.844 ✓ $\sqrt{\Delta p}$ = 0.1039 ✓ / 0.0108 ✓ $\overline{\Delta H}$ = 0.64 ✓ $\overline{Ts}$ = 263 ✓ $\overline{Tm}$ = ~~96.5~~ 95.3 ✓ [illegible] 9/10/03

Environmental Quality Management, Inc.

SAMPLE RECOVERY DATA

Plant Scott AFB Run No. L-5-3

Date 9/11/03 Sample Box No. H2B-1 Job No.

Sample Location Light Generator Filter No. ~~830470~~ PC013

Train Preparer DA

Sample Recovery Person RK

Comments M5/particle size

Front Half

Acetone Container No. ______ Liquid Level Marked ______ Sealed ______

Filter Container No. ______ Sealed ______

Description of Filter ______

Samples Stored and Locked ______

Back Half/Moisture

Container No. ______

Liquid Level Marked ______ Sealed ______

Imp. No.	Contents	Initial Vol (ml)	Weight (grams) Initial	Final	Net
1	DI H_2O	100	734.5	791.8	57.3 ✓
2	"	100	710.4	673.2	-37.2 ✓
3	—	—	623.5	622.4	-1.1 ✓
4	SG.	250	823.2	836.1	12.9 ✓
5					
6					
Total					31.9 ✓

Description of Impinger Catch: Slightly cloudy

KP 9/11/03

Environmental Quality Management, Inc

EPA METHOD 30
VOLATILE ORGANIC SAMPLING TRAIN (VOST) SAMPLING DATA

Company: Scott AFB
Date: 9/10/03
Time: 1328 - 1428
Meter #: VB-1
Barometric Pressure, in.Hg: 30.68
Ambient Temperature, °F: ______

City: O Fallon Illinois
Location: MF2 Exhaust
Run #: 0030-2
Y-Factor: ______
Operator: RK
Purge Time: ______

Vacuum Leak Check Data

	Initial, in.Hg	Final, in.Hg	Time, min.
Pre-test:			
Post-test:			

Sample Time (min)	Clock Time, (24-hr)	Meter Volume, (liter)	Rotameter Setting	Dry Gas Meter Temp., (°F)	Vacuum, (in.Hg)	Probe Temp, °F
0	1328	9833.90	0.25	97/97	1	250
5	1333	9835.6	0.25	98/98	1	250
10	1338	9837.1	0.25	98/98	1	250
15	1343	9838.3	0.25	101/98	1	250
20	1348	9839.5	0.25	98/98	1	250
25	1353	9840.8	0.25	100/100	1	250
30	~~1403~~ 1358	9842.1	0.25	100/100	1	250
35	1408 1403	9843.5	0.25	101/101	1	250
40	1413 1408	9844.6	0.25	100/101	1	250
45	1418 1413	9845.9	0.25	101/102	1	250
50	1423 1418	9847.2	0.25	101/102	1	250
55	1428 1423	9848.5	0.25	103/103	1	256
60	1433 1428	9849.82	0.25	102/103	1	250

Nitrogen purge/activated carbon packing in sample holding container: ______

$$V_{std} = V_m(\text{liters}) \times Y \times 17.647 \times \frac{P_b(\text{in.Hg})}{T_m(°R)}$$

V_{std}

Environmental Quality Management, Inc

EPA METHOD ~~30~~ 5515 - PAH
VOLATILE ORGANIC SAMPLING TRAIN (VOST) SAMPLING DATA

Company: Scott AFB
Date: 9/10/03
Time: 1328-1428
Meter #: VB-2
Barometric Pressure, in.Hg: 30.68
Ambient Temperature, °F: ______

City: O'Fallon, Illinois
Location: MF2 Exhaust
Run #: 5515 - 2
Y-Factor: ______
Operator: [illegible]
Purge Time: ______

Vacuum Leak Check Data

	Initial, in.Hg	Final, in.Hg	Time, min.
Pre-test:			
Post-test:			

Sample Time (min)	Clock Time, (24-hr)	Meter Volume, (liter)	Rotameter Setting	Dry Gas Meter Temp., (°F)	Vacuum, (in.Hg)	Probe Temp, °F
0	1328	5533.96	0.25	98 / 97	1	N/A
5	1333	5535.7	0.25	100 / 97	1	N/A
10	~~1343~~ 1338	5537.1	0.25	100 / 97	1	N/A
15	~~1348~~ 1343	5538.5	0.25	98 / 99	1	N/A
20	~~1353~~ 1348	5539.8	0.25	101 / 98	1	N/A
25	~~1358~~ 1353	5541.2	0.25	101 / 99	1	N/A
30	~~1403~~ 1358	5542.8	0.25	102 / 100	1	N/A
35	~~1408~~ 1403	5544.2	0.25	103 / 100	1	N/A
40	~~1413~~ 1408	5545.6	0.25	103 / 100	1	N/A
45	~~1418~~ 1413	5546.9	0.25	103 / 101	1	N/A
50	1418	5548.2	0.25	104 / 101	1	N/A
55	1423	5549.6	0.25	104 / 102	1	N/A
60	1428	5551.11	0.25	104 / 102	1	N/A

Nitrogen purge/activated carbon packing in sample holding container: ______

$$V_{std} = V_m\,(\text{liters}) \times Y \times 17.647 \times \frac{P_b\,(\text{in.Hg})}{T_m\,(^\circ R)}$$

V_{std}

FIELD DATA SHEET

Plant: Scott AFB
Sampling Location: MF2 Exhaust
Run Number: 0011-2 Date: 9/10/03
Pretest Leak Rate: 0.002 cfm @ 10 in.Hg.
Pretest Leak Check: Pitot: ✓ Orsat: –

Sample Type: 0011 Operator: RK
Pbar: 30.68 Ps: 0.01
CO_2: ______ O_2: ______
Probe Length/Type: 2' Glass Pitot#: ______
Stack Diameter: 4" As: ______

Nozzle ID: 0.500 Thermocouple #: ______
Assumed Bws: 4 Filter #: —
Meter Box #: 8 Y: 1.003 ΔH@: 1.547
Post-Test Leak Rate: 0.001 cfm @ 7 in.Hg.
Post-Test Leak Check: Pitot: ______ Orsat: ______

Traverse Point Number	Sampling Time	Clock Time	Gas Meter Reading	Velocity Head	ΔH		Stack Temp (Ts)	Temperature °F		Impinger Temp. °F	Dry Gas Meter Temp. Tm		Pump Vacuum (in. Hg)
					Desired	Actual		Probe	Filter		Inlet	Outlet	
	0	1325	556.942										
	5	1330	559.1	0.0108	0.63	0.63	263	250	250	64	100	100	1
	10	1335	561.8	0.0108	0.63	0.63	263	250	250	64	97	98	1
	15	1340	564.2	0.0108	0.63	0.63	263	250	250	63	97	98	1
	20	1345	566.9	0.0108	0.63	0.63	263	251	250	64	97	98	1
	25	1350	569.1	0.0108	0.63	0.63	263	256	249	64	98	97	1
	30	1355	571.6	0.0108	0.63	0.63	263	250	251	59	99	98	1
	35	1400	574.1	0.0108	0.63	0.63	263	250	249	57	100	98	1
	40	1405	576.6	0.0108	0.63	0.63	263	251	250	58	100	98	1
	45	1410	579.1	0.0108	0.63	0.63	263	251	250	57	101	98	1
	50	1415	581.4	0.0108	0.63	0.63	263	247	249	57	101	98	1
	55	1420	584.0	0.0108	0.63	0.63	263	250	250	57	101	98	1
	60	1425	586.370	0.0108	0.63	0.63	263	250	250	58	101	98	1

$\Delta Vm =$ 29.428 ✓ $\overline{\sqrt{\Delta p}} =$ 0.1039 ✓ $\overline{\Delta H} =$ 0.63 ✓ $\overline{Ts} =$ 263 ✓ $\overline{Tm} =$ 98.7 ✓

$\Delta P = 0.0108$

RK 9/11/03

Environmental Quality Management, Inc.

SAMPLE RECOVERY DATA

Plant Scott AFB Run No. 0011-2
Date 9/10/03 Sample Box No. SB-3 Job No. 030174.006.002
Sample Location MF2 Exhaust Filter No. N/A
Train Preparer DA/RK
Sample Recovery Person DA/RK
Comments Aldehyde/Ketone train

Front Half
Acetone Container No. ______ Liquid Level Marked ______ Sealed ______

Filter
Container No. ______ Sealed ______

Description of Filter ______

Samples Stored and Locked ______

Back Half/Moisture
Container No. ______

Liquid Level Marked ______ Sealed ______

Imp. No.	Contents	Initial Vol (ml)	Weight (grams) Initial	Final	Net
1	DNPH	100ml	822.7	845.2	22.5
2	DNPH	100ml	727.4	728.9	1.5
3	DNPH	100ml	724.9	724.1	-0.8
4	SILICA GEL		831.5	842.8	11.3
5					
6					
Total					34.5

Description of Impinger Catch: Precipitate in first impinger

9/11/03

N:\Forms\Forms\Emission Testing\Sample Recovery Data.doc

APPENDIX C

ANALYTICAL RESULTS

Environmental Quality Management, Inc.

PROJECT ANALYTICAL SHEET (sheet 1 of 2)

Project Name: Scott AFB
Project No.: 030174.0006.002
Project Date(s): 9/8-11/03
Project Manager: Gerstle
Method(s): 5
No. of Sites: 1

RUN NO.	ID NO.	#/DESCRIPTION	TARE MASS	FINAL MASS	NET MASS
10-5-1	2003-353	Filter 830573	338.36 ~~339.1~~ pk	350.55	12.2 ✓
10-5-1	-354	Acetone 774	107,099.3	107,110.~~98~~ .95	~~10.75~~ 11.65 rA
10-2	-355	Filter PC025	53.55	59.45	5.9 ✓
10-2	-356	Acetone 854	108,675.35	108,687.1	11.75 ✓
10-3	-357	Filter 830574	339.0	347.45	8.45 ✓
10-3	-358	Acetone 771	108,116.8	108,130.6	13.8 ✓
25-1	-359	Filter 830572	340.3	353.15	12.85 ✓
25-1	-360	Acetone 762	110,129.95	110,153.55	23.6 ✓
25-2	-361	Filter PC026	53.8	59.65	5.85 ✓
25-2	-362	Acetone 512	115,633.8	115,656.65	22.85 ✓
25-3	-363	Filter 830556	339.95	351.9	11.95 ✓
25-3	-364	Acetone 360	114,787.6	114,803.1	15.5 ✓
50-1	-365	Filter 830557	336.75	353.15	16.4 ✓
50-1	-366	Acetone 663	107,612.0	107,637.7	25.7 ✓
50-2	-367	Filter PC016	55.2	57.75	2.55 ✓
50-2	-368	Acetone 519	109,350.55	109,363.4	12.85 ✓
50-3	-369	Filter 830558	339.3	353.35	14.05 ✓
50-3	-370	Acetone 555	115,305.8	115,340.5	34.7 ✓
75-1	-371	Filter 830559	338.05	388.6	50.55 ✓
75-1	-372	Acetone 589	114,929.9	114,958.05	28.15 ✓
75-2	-373	Filter PC019	54.3	57.9	3.6 ✓
75-2	-374	Acetone 615	108,073.65	108,085.55	11.9 ✓
75-3	-375	Filter 830445	256.1	265.3	9.2 ✓

Environmental Quality Management, Inc

PROJECT ANALYTICAL SHEET (sheet 2 of 2)

RUN NO.	ID NO.	#/DESCRIPTION	TARE MASS	FINAL MASS	NET MASS
75-3	-376	Acetone 626	114,422.9	114,440.35	17.45 ✓
100-1	-377	Filter 830455	254.4	257.15	2.75 ✓
100-1	-378	Acetone 773	109,944.85	109,953.7	8.85 ✓
100-2	-379	Filter PC017	54.9	59.55	4.65 ✓
100-2	-380	Acetone 772	109,872.7	109,878.2	5.5 ✓
100-3	-381	Filter 830502	338.65	342.3	3.65 ✓
100-3	-382	Acetone 793	109,555.15	109,564.35	9.2 ✓
100-4	-383	Filter 830532	337.45	340.8	3.35 ✓
100-4	-384	Acetone 755	108,486.6	108,495.4	8.8 ✓
L-1	-385	Filter 830533	337.5	345.05	7.55 ✓
L-1	-386	Acetone 665	108,452.1	108,457.5	5.4 ✓
L-2	-387	Filter 830527	339.25	347.0	7.75 ✓
L-2	-388	Acetone 660	110,426.35	110,430.8	4.45 ✓
L-3	-389	Filter PC013	55.8	62.45	6.65 ✓
L-3	-390	Acetone 783	108,887.25	108,891.6	4.35 ✓
Blank	-391	Blank Filter 830470	257.9	258.1	0.2 ✓
Blank	-392	Blank Filter PC	49.8	55.0	0.2 ✓
Blank	-393	Blank Acetone 759	109,002.25	109,003.45	1.2 ✓

First Analytical Laboratories
1126 Burning Tree Dr. Chapel Hill, NC 27517
Tel. (919) 942-8607
FAX (919) 929-8688
www.firstanalyticallabs.com

ANALYSIS REPORT

CONDENSIBLE PARTICULATE WEIGHT

Project #: 30912
Client: Environmental Quality Management
Client Project ID: 030174.0006.002

Report Date: 22-Sep-03
Date Received: 16-Sep-03

Sample ID Client	FAL	Particulate Weight mg
TOTALS		
Blank	30912.B	0.4
10-5-1	30912.101	31.6
10-5-2	30912.102	26.2
10-5-3	30912.103	31.3
25-5-1	30912.251	27.8
25-5-2	30912.252	23.0
25-5-3	30912.253	35.7
50-5-1	30912.501	44.8
50-5-2	30912.502	10.9
50-5-3	30912.503	46.4
75-5-1	30912.751	41.6
75-5-2	30912.752	8.4
75-5-3	30912.753	53.6
100-5-1	30912.1001	37.5
100-5-2	30912.1002	3.7
100-5-3	30912.1003	55.4
100-5-4	30912.1004	45.3
L-5-1	30912.L1	25.7
L-5-2	30912.L2	20.4
L-5-3	30912.L3	28.6

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ANALYSIS REPORT

CONDENSIBLE PARTICULATE WEIGHT

Project #: 30912
Client: Environmental Quality Management
Client Project ID: 030174.0006.002

Report Date: 22-Sep-03
Date Received: 16-Sep-03

Sample ID Client	FAL	Tare Weight g	Final Weight g	Particulate Weight mg
ORGANIC FRACTION				
MeCl2 Blank	30912.OB	4.3643	4.3647	0.4
10-5-1	30912.O101	4.3797	4.3920	12.3
10-5-2	30912.O102	4.3745	4 3867	12.2
10-5-3	30912.O103	4.3586	4.3710	12.4
25-5-1	30912.O251	4.3669	4.3794	12 5
25-5-2	30912.O252	4.3624	4.3731	10.7
25-5-3	30912.O253	4.3575	4.3695	12.0
50-5-1	30912.O501	4.3541	4.3654	11.3
50-5-2	30912.O502	4.3506	4.3540	3.4
50-5-3	30912.O503	4.3326	4.3452	12 6
75-5-1	30912.O751	4 3639	4.3658	1.9
75-5-2	30912.O752	4.2115	4.2142	2.7
75-5-3	30912.O753	4.2529	4.2699	17 0
100-5-1	30912.O1001	4.3636	4.3768	13.2
100-5-2	30912 O1002	4.3419	4.3436	1.7
100-5-3	30912.O1003	4.3653	4.3716	6.3
100-5-4	30912.O1004	4.3604	4.3707	10.3
L-5-1	30912.OL1	4.3804	4.3839	3.5
L-5-2	30912.OL2	4.3544	4.3565	2.1
L-5-3	30912.OL3	4.3764	4.3804	4.0

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ANALYSIS REPORT

CONDENSIBLE PARTICULATE WEIGHT

Project #: 30912
Client: Environmental Quality Management
Client Project ID: 030174.0006.002

Report Date: 22-Sep-03
Date Received: 16-Sep-03

Sample ID Client	FAL	Tare Weight g	Final Weight g	Particulate Weight mg
AQUEOUS FRACTION				
H2O Blank	30912.AB	8.4189	8.4169	-2.0
10-5-1	30912.A101	8.3371	8.3564	19.3
10-5-2	30912.A102	8.2439	8.2579	14.0
10-5-3	30912.A103	8.2186	8.2375	18.9
25-5-1	30912.A251	8.3165	8.3318	15.3
25-5-2	30912.A252	8.3577	8.3700	12.3
25-5-3	30912.A253	8.2867	8.3104	23.7
50-5-1	30912.A501	8.3250	8.3585	33.5
50-5-2	30912.A502	8.2465	8.2540	7.5
50-5-3	30912.A503	8.3047	8.3385	33.8
75-5-1	30912.A751	8.4274	8.4671	39.7
75-5-2	30912.A752	8.3250	8.3307	5.7
75-5-3	30912.A753	8.3767	8.4133	36.6
100-5-1	30912.A1001	8.3255	8.3498	24.3
100-5-2	30912.A1002	8.3928	8.3948	2.0
100-5-3	30912.A1003	8.3112	8.3603	49.1
100-5-4	30912.A1004	8.3945	8.4295	35.0
L-5-1	30912.AL1	8.4313	8.4535	22.2
L-5-2	30912.AL2	8.3744	8.3927	18.3
L-5-3	30912.AL3	8.2110	8.2356	24.6

Environmental Quality Management, Inc.

-30912

EQ Environmental Quality Management, Inc.

-86 Generator + MF2

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

Project Name: Scott Air Force Base
Project Number: 030174.0006.002
Project Manager: Tom Gerstle
Sample Team Leader: Ron Kolde

Lab Destination: First Analytical
Lab Contact/Phone: Bill Wadlin
Lab Purchase Order No.: 6258
Carrier/Waybill No.:

Reference Document No.
Page 1 of
Report to: Tom Gerstle - EQ
1800 Carillon Blvd
Cincinnati OH 45240
513-825-7500
Bill to: Same

ONE CONTAINER PER LINE

Sample Number	Sample Description/Type	Date/Time Collected	Container Type	Sample Volume	Pre-servative	Requested Analytical Method/(Parameters)	Condition of Receipt (Lab)
10-5-1	MeCl2 rinse, water fraction	9/8/03	Glass/Nalgene	UNK		EPA Method 202 for	
10-5-2	" "	↓				Condensable Particulate	
10-5-3	" "	↓				Matter	
25-5-1	" "	9/9/03					
25-5-2	" "	↓					

Special Instructions:

Possible Hazard Identification:
Non-hazard ☐ Flammable ☐ Skin Irritant ☒ Other ______

Sample Disposal:
Return to Client ☐ Disposal by Lab ☒ Archive 6 (mos.)

Turnaround Time Required:
Normal ☒ Rush ☐ Results Required by ______

QA Requirements:

1. Relinquished by (Signature/Affiliation) Ron Kolde Date: 9/12/03 Time:

1. Received by (Signature/Affiliation) W. Wadlin FAL Date: 9/16/03 Time: 10:30am

2. Relinquished by (Signature/Affiliation) Date: Time:

2. Received by (Signature/Affiliation) Date: Time:

Comments:

Environmental Quality Management, Inc.

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD (cont.)

_30912

– 86 Generator and MF2 Lighting Unit

Reference Document No. ________

Page 2 of 2

Project Name Scott Air Force Base   Project No. 030174.006.002   Sample Shipment Date ________

ONE CONTAINER PER LINE

Sample Number	Sample Description/Type	Date/Time Collected	Container Type	Sample Volume	Pre-servative	Requested Analytical Method/(Parameters)	Condition on Receipt (Lab)
25-5-3	MeCl2 rinse; water Fraction	9/9/03	Glass; Nalgene	Unknown		EPA Method 202	
50-5-1						for Condensable	
50-5-2						Particulate Matter	
50-5-3							
75-5-1							
75-5-2							
75-5-3							
100-5-1		9/10/03					
100-5-2							
100-5-3							
L-5-1							
L-5-2							
L-5-3							
MeCl2 Blank	Methylene Chloride						
H2O Blank	DI H2O						

NO POUCH NEEDED.
See back for peel and stick application instructions.
RECIPIENT: PEEL HERE

102
500

FedEx Express USA Airbill — FedEx Tracking Number 8401 8907 8000

0215091 2 — Recipient's Copy

1 From This portion can be removed for Recipient's records.

Date 9/12/03 — FedEx Tracking Number 840189078000

Sender's Name Ron Kolde — Phone 513 825-7500

Company ENVIRONMENTAL QUALITY MGMT 30912

Address 1800 CARRILLON BLVD.

Dept./Floor/Suite/Room

City CINCINNATI — State OH — ZIP 45240

2 Your Internal Billing Reference 030174.0206.002

3 To

Recipient's Name Bill Wadlin — Phone 919 942-8609

Company First Analytical

Address 1126 Burning Tree Drive

To "HOLD" at FedEx location, print FedEx address. We cannot deliver to P.O. boxes or P.O. ZIP codes.

Address

Dept./Floor/Suite/Room

City Chapel Hill — State NC — ZIP 27514

8401 8907 8000

0245264407

4a Express Package Service — *Packages up to 150 lbs.* Delivery commitment may be later in some areas.

- [x] FedEx Priority Overnight — Next business morning
- [ ] FedEx Standard Overnight — Next business afternoon
- [ ] FedEx First Overnight — Earliest next business morning delivery to select locations
- [ ] FedEx 2Day — Second business day
- [ ] FedEx Express Saver — Third business day

* FedEx Envelope rate not available. Minimum charge: One-pound rate

4b Express Freight Service — *Packages over 150 lbs.* Delivery commitment may be later in some areas.

- [ ] FedEx 1Day Freight* — Next business day
- [ ] FedEx 2Day Freight — Second business day
- [ ] FedEx 3Day Freight — Third business day

* Call for Confirmation:

5 Packaging — * Declared value limit $500

- [ ] FedEx Envelope*
- [ ] FedEx Pak* — Includes FedEx Small Pak, FedEx Large Pak, and FedEx Sturdy Pak
- [x] Other

6 Special Handling — Include FedEx address in Section 3.

- [ ] SATURDAY Delivery — Available only for FedEx Priority Overnight and FedEx 2Day to select ZIP codes
- [ ] HOLD Weekday at FedEx Location — Not available for FedEx First Overnight
- [ ] HOLD Saturday at FedEx Location — Available only for FedEx Priority Overnight and FedEx 2Day to select locations

Does this shipment contain dangerous goods? One box must be checked.

- [ ] No
- [x] Yes — As per attached Shipper's Declaration
- [ ] Yes — Shipper's Declaration not required
- [ ] Dry Ice — Dry Ice, 9, UN 1845 ____ x ____ kg
- [ ] Cargo Aircraft Only

Dangerous Goods (including Dry Ice) cannot be shipped in FedEx packaging.

7 Payment Bill to: — Enter FedEx Acct. No. or Credit Card No. below.

- [x] Sender — Acct. No. in Section 1 will be billed.
- [ ] Recipient
- [ ] Third Party
- [ ] Credit Card
- [ ] Cash/Check
- [ ] Obtain Recip. Acct. No.

Total Packages 1 — Total Weight 23 — Total Charges — Credit Card Auth.

†Our liability is limited to $100 unless you declare a higher value. See the *FedEx Service Guide* for details.

8 Release Signature — Sign to authorize delivery without obtaining signature.

By signing you authorize us to deliver this shipment without obtaining a signature and agree to indemnify and hold us harmless from any resulting claims.

Questions? Visit our Web site at fedex.com
or call 1.800.Go.FedEx® 800.463.3339.

SRF• Rev. Date 4/02•Part #157610S•©1994–2002 FedEx•PRINTED IN U.S.A.

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NO POUCH NEEDED.
See back for peel and stick application instructions.
RECIPIENT: PEEL HERE

101
500

FedEx Express *USA Airbill* FedEx Tracking Number 8401 8907 7997

Recipient's Copy

1 From This portion can be removed for Recipient's records.
Date 9/15/03 FedEx Tracking Number 840189077997
Sender's Name Ron Kolde Phone 513 825-7500
Company ENVIRONMENTAL QUALITY MGMT
Address 1800 CARRILLON BLVD Dept/Floor/Suite/Room
City CINCINNATI State OH ZIP 45240

2 Your Internal Billing Reference 030174.0006.002

3 To
Recipient's Name Bill Wadlin Phone 919 929-8603
Company First Analytical
Address 1126 Burning Tree Drive
To "HOLD" at FedEx location, print FedEx address. We cannot deliver to P.O. boxes or P.O. ZIP codes.
Address Dept/Floor/Suite/Room
City Chapel Hill State NC ZIP 27514

8401 8907 7997

0245264407

4a Express Package Service *Packages up to 150 lbs.* Delivery commitment may be later in some areas.
- [ ] FedEx Priority Overnight — Next business morning
- [x] FedEx Standard Overnight — Next business afternoon
- [ ] FedEx First Overnight — Earliest next business morning delivery to select locations
- [ ] FedEx 2Day — Second business day
- [ ] FedEx Express Saver — Third business day

FedEx Envelope rate not available. Minimum charge: One-pound rate

4b Express Freight Service *Packages over 150 lbs.* Delivery commitment may be later in some areas.
- [ ] FedEx 1Day Freight* — Next business day
- [ ] FedEx 2Day Freight — Second business day
- [ ] FedEx 3Day Freight — Third business day

* Call for Confirmation:

5 Packaging * Declared value limit $500
- [ ] FedEx Envelope*
- [ ] FedEx Pak* — Includes FedEx Small Pak, FedEx Large Pak, and FedEx Sturdy Pak
- [x] Other

6 Special Handling Include FedEx address in Section 3.
- [ ] SATURDAY Delivery — Available only for FedEx Priority Overnight and FedEx 2Day to select ZIP codes
- [ ] HOLD Weekday at FedEx Location — Not available for FedEx First Overnight
- [ ] HOLD Saturday at FedEx Location — Available only for FedEx Priority Overnight and FedEx 2Day to select locations

Does this shipment contain dangerous goods? One box must be checked.
- [x] No
- [ ] Yes As per attached Shipper's Declaration
- [ ] Yes Shipper's Declaration not required
- [ ] Dry Ice Dry Ice, 9, UN 1845 ___ x ___ kg
- [ ] Cargo Aircraft Only

Dangerous Goods (including Dry Ice) cannot be shipped in FedEx packaging.

7 Payment Bill to: Enter FedEx Acct. No. or Credit Card No. below.
- [x] Sender Acct. No. in Section 1 will be billed.
- [ ] Recipient
- [ ] Third Party
- [ ] Credit Card
- [ ] Cash/Check
- [ ] Obtain Recip. Acct. No.

Total Packages	Total Weight	Total Charges
1	23	

Credit Card Auth.

†Our liability is limited to $100 unless you declare a higher value. See the FedEx Service Guide for details.

8 Release Signature Sign to authorize delivery without obtaining signature.

By signing you authorize us to deliver this shipment without obtaining a signature and agree to indemnify and hold us harmless from any resulting claims.

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MVA, Inc.
Excellence in
Microanalysis

6 October 2003

Mr. Tom Gerstle
Environmental Quality Management
1800 Carillon Blvd.
Cincinnati, OH 45240

Dear Mr. Gerstle,

Enclosed is our report of results for the particle size distribution and description of particle morphology of seven samples plus a field blank. If you have any questions, please do not hesitate to contact me.

Thank you for consulting MVA, Inc. We will retain your samples for thirty (30) days prior to disposal.

Sincerely,

Tim B. Vander Wood, Ph.D.
Executive Director

Enclosure

5735execsum100603.doc

Report of Results: MVA5735

Particle Size Distribution
EQ Project Name: Scott AFB

Prepared for:

Environmental Quality Management
1800 Carillon Blvd.
Cincinnati, OH 45240

Prepared by:

MVA, Inc.
5500 Oakbrook Parkway, Suite 200
Norcross, GA 30093

Respectfully Submitted by: Tim B. Vander Wood

Tim B. Vander Wood, Ph.D.
Executive Director

6 October 2003

5735report100603.doc

MVA, Inc.
Excellence in
Microanalysis

5500 Oakbrook Parkway #200
Norcross, GA 30093
770-662-8509 • FAX 770-662-8532
www.mvainc.com

Report of Results: MVA5735

Particle Size Distribution
EQ Project Name: Scott AFB

Introduction

On 29 September we received seven samples, including a field blank, along with a request that we determine the particle size distribution of the samples as well as provide a description of the particle morphology. Documentation accompanying the samples indicated they were from EQ Project 030174.0006.002, Scott AFB. Upon receipt in our laboratory, the samples were assigned MVA samples numbers as follows:

EQ Sample Number	MVA Sample Number
10-5-2	5735N1542
25-5-2	5735N1543
50-5-2	5735N1544
75-5-2	5735N1545
100-5-2	5735N1546
L-5-3	5735N1547
Blank	5735N1548

Analyses were carried out during the period 29 September through 3 October.

Methods

Each filter was examined under a stereomicroscope at magnifications up to 40X. Particles from each sample were redispersed and analyzed in automated mode in a JEOL 6400 scanning electron microscope (SEM) equipped with a Noran Voyager energy dispersive x-ray spectrometer and digital imaging and automation system. Additional portions of each sample were prepared and imaged in our JEOL 1200EX transmission electron microscope (TEM) equipped with a Scientific Instruments digital imaging system. Samples were prepared for TEM using a modified form of ASTM 6602. Particle size measurements were made from the TEM images using NIH Image software.

Results and Discussion

Visual inspection of the filters and examination under the stereomicroscope indicated that they were heavily loaded with a black particulate. Initial SEM examination indicated that most of the particulate was soot, including aciniform soot aggregates. However, a significant population of non-carbon particles was also present.

Non-carbon particles were sized in the SEM and Tables 1 and 2 contain the results of those measurements. Table 1 presents the particle size distribution by number of non-carbon particles in each size class. Table 2 presents the estimated mass on non-carbon particles in each size bin, based on the assumption that all of the particles are of equal density.

Transmission electron microscope images of typical carbon particles in each sample (except the blank) are included as Figures 1 through 12. These particles are consistent with aciniform soot, and are composed of fragile aggregates of individual particles. The fundamental particle size of the soot is the size of the "grapes" making up the aggregate "bunches," and Table 3 contains the results of manual sizing of approximately 50 fundamental soot particles from each sample. The mean soot particle diameter is on the order of 25 nm for all samples.

Table 1. Percentage of Number of Non-Carbon Particles in Various Size Ranges

EQM Sample Number: MVA Sample Number:	10-5-2 N1542	25-5-2 N1543	50-5-2 N1544	75-5-2 N1545	100-5-2 N1546	L-5-3 N1547	Blank N1548
Average Diameter (µm)							
0.5-2.5	80.47	83.96	84.51	82.14	84.50	89.40	91.36
2.5-5.0	14.63	12.00	11.79	13.85	13.18	8.61	4.94
5.0-7.5	3.62	2.78	2.31	2.43	1.55	1.66	2.47
7.5-10	0.91	0.87	0.35	0.96	0.00	0.00	1.23
>10	0.38	0.38	1.04	0.62	0.78	0.33	0.00
Total Number of Particles	2099	1833	865	1769	129	302	81

Table 2. Percentage of Estimated Mass of Non-Carbon Particles in Various Size Ranges

EQM Sample Number: MVA Sample Number:	10-5-2 N1542	25-5-2 N1543	50-5-2 N1544	75-5-2 N1545	100-5-2 N1546	L-5-3 N1547	Blank N1548
Average Diameter (µm)							
0.5-2.5	9.74	8.27	3.24	7.75	7.54	8.96	12.71
2.5-5.0	23.99	18.92	5.33	18.08	17.78	17.26	9.74
5.0-7.5	24.39	21.55	5.39	14.15	10.18	10.27	38.77
7.5-10	14.26	18.58	2.36	13.66	0.00	0.00	38.78
>10	27.62	32.68	83.68	46.36	64.50	63.52	0.00

Table 3. Carbon Soot Fundamental Particle Size Measurements

EQM Sample Number: MVA Sample Number:	10-5-2 N1542	25-5-2 N1543	50-5-2 N1544	75-5-2 N1545	100-5-2 N1546	L-5-3 N1547
Diameter (nm)						
Mean	32.0	24.4	38.3	30.7	36.0	28.5
Median	28.7	22.2	37.8	28.2	33.9	26.8
Standard Deviation	12.3	9.2	9.9	9.8	10.4	7.8
Minimum	18.5	12.9	19.3	16.3	20.4	14.8
Maximum	89.1	64.4	63.0	57.8	62.6	51.7
Count	50	57	52	59	53	52

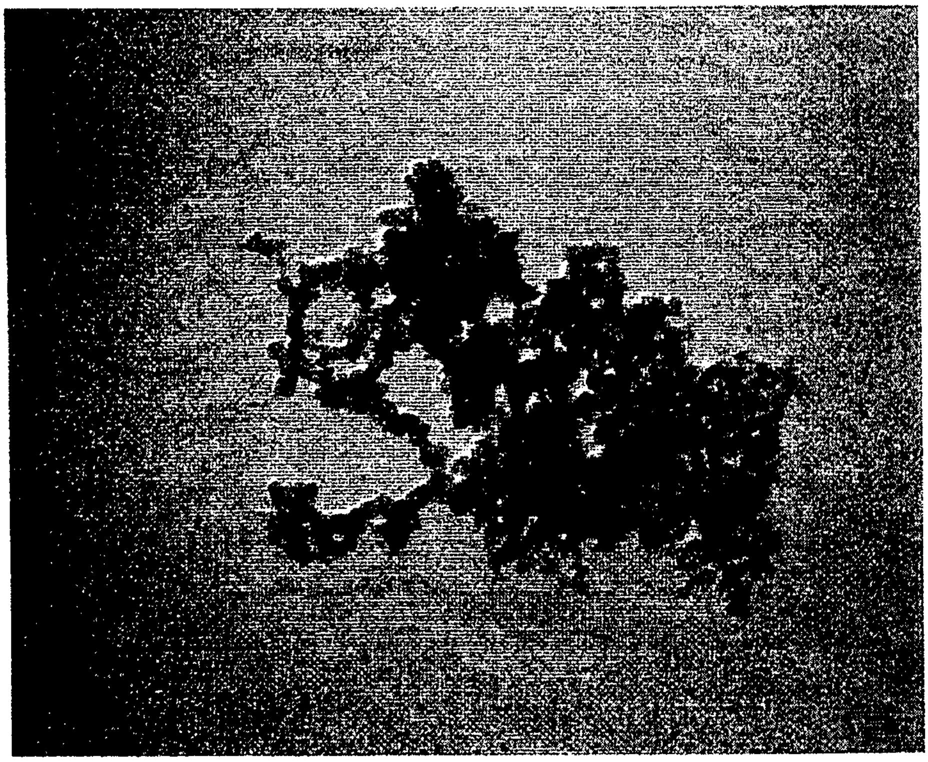

Figure 1. Transmission electron microscope image of aciniform carbon in sample 5735N1542 (10-5-2).

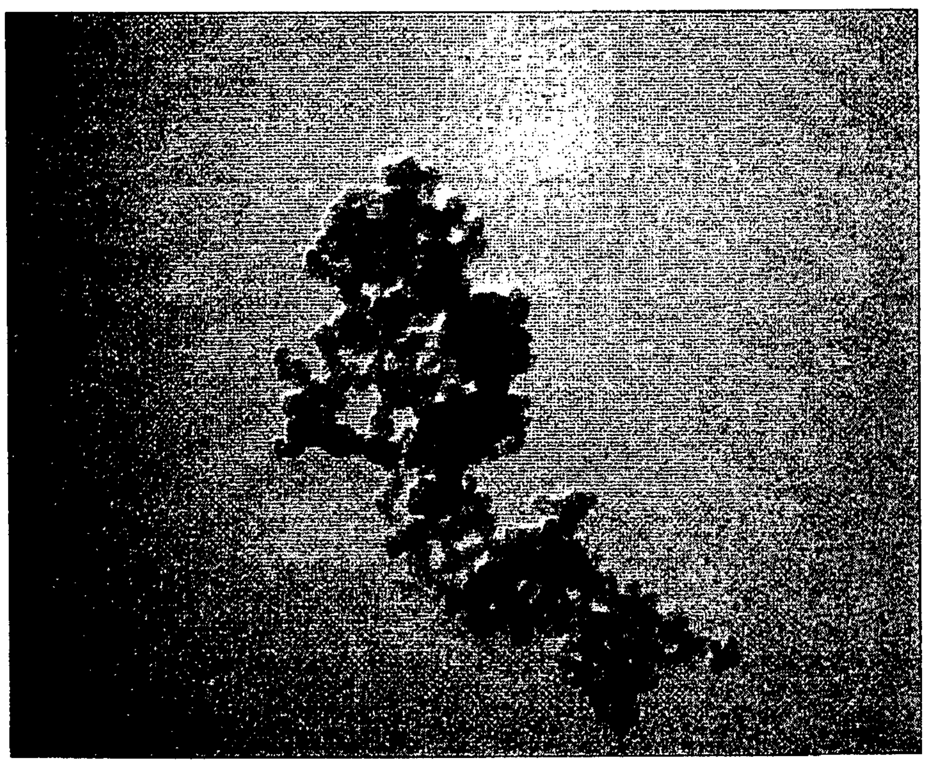

Figure 2. Transmission electron microscope image of aciniform carbon in sample 5735N1542 (10-5-2).

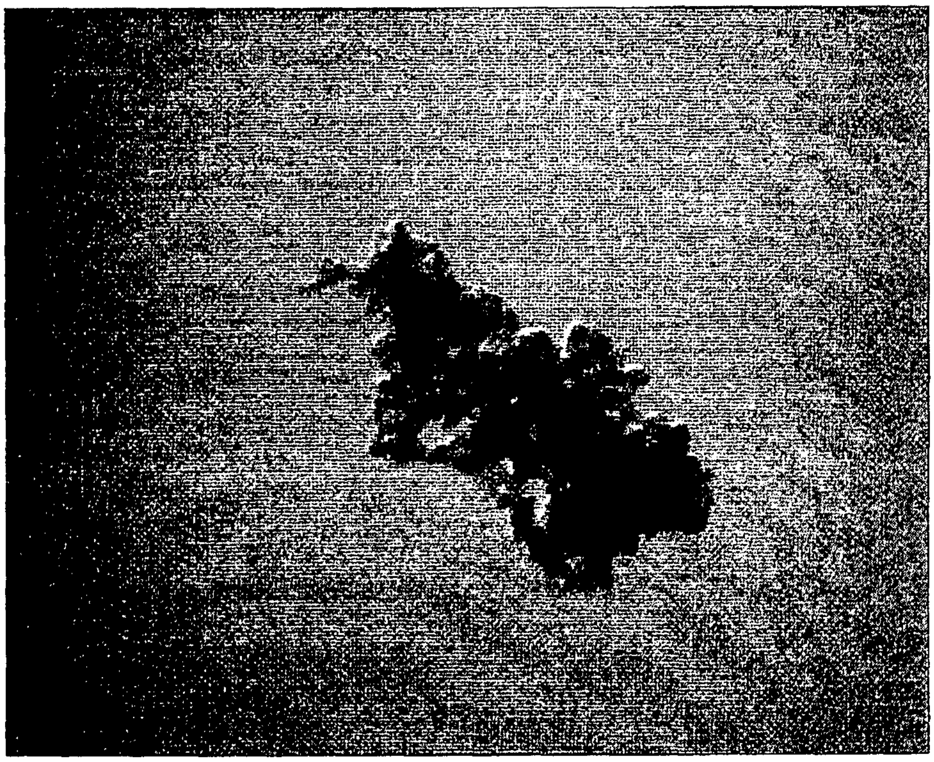

Figure 3. Transmission electron microscope image of aciniform carbon in sample 5735N1543 (25-5-2).

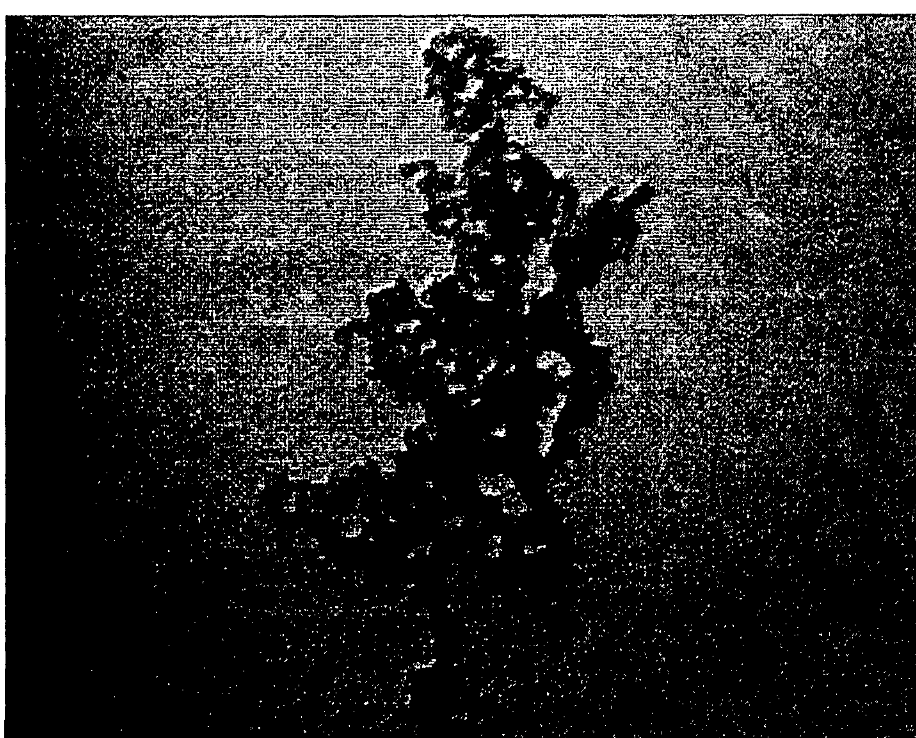

Figure 4. Transmission electron microscope image of aciniform carbon in sample 5735N1543 (25-5-2).

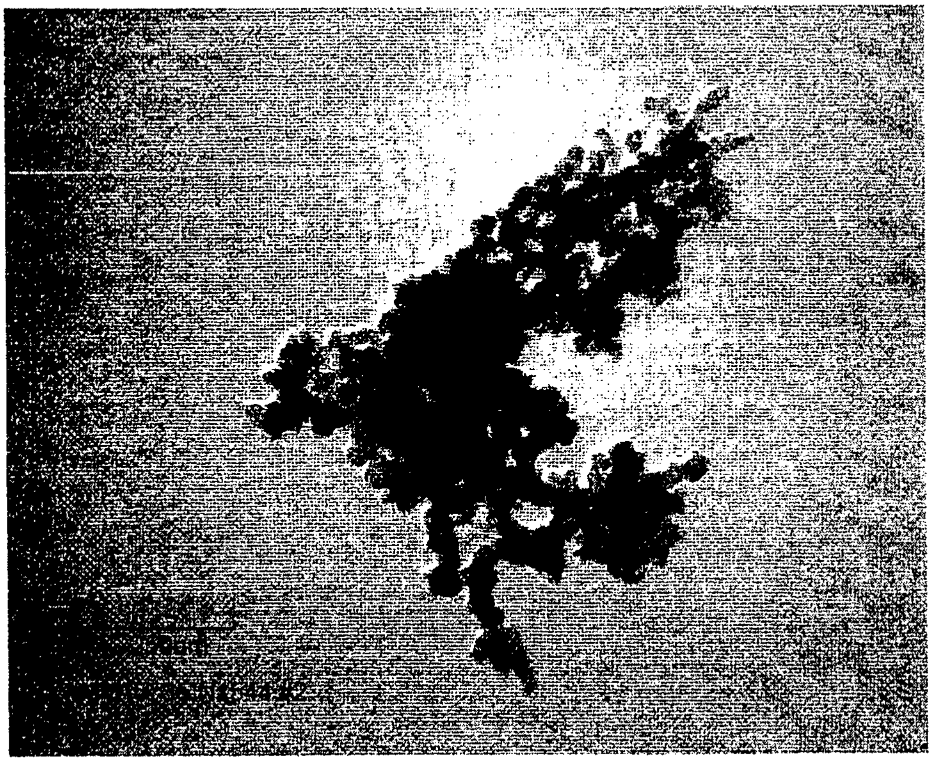

Figure 5. Transmission electron microscope image of aciniform carbon in sample 5735N1544 (50-5-2).

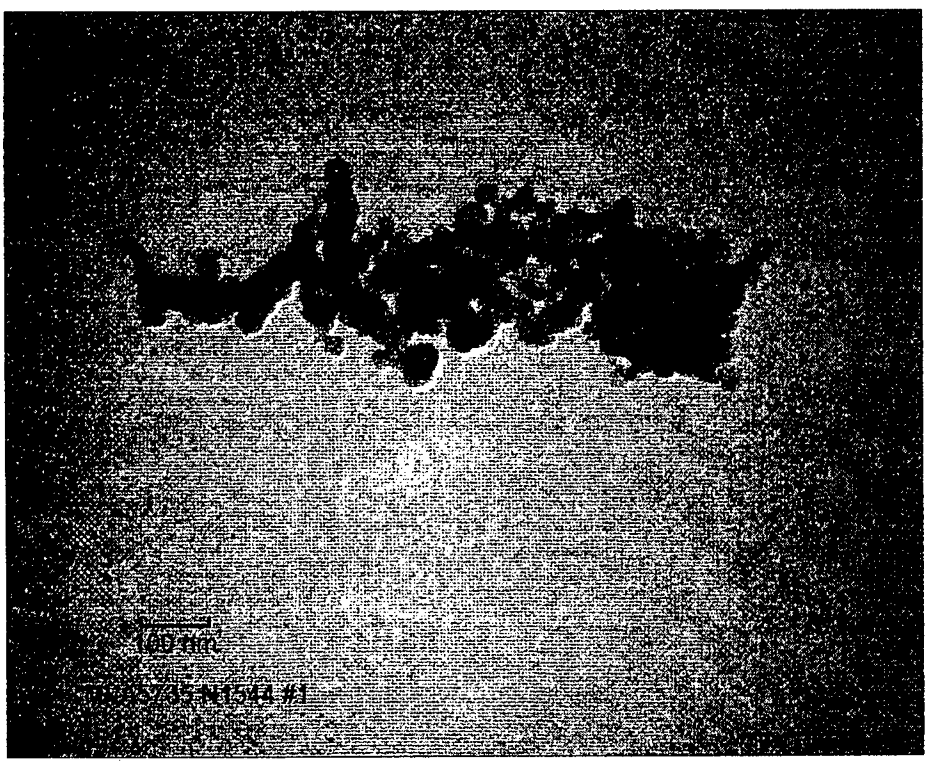

Figure 6. Transmission electron microscope image of aciniform carbon in sample 5735N1544 (50-5-2).

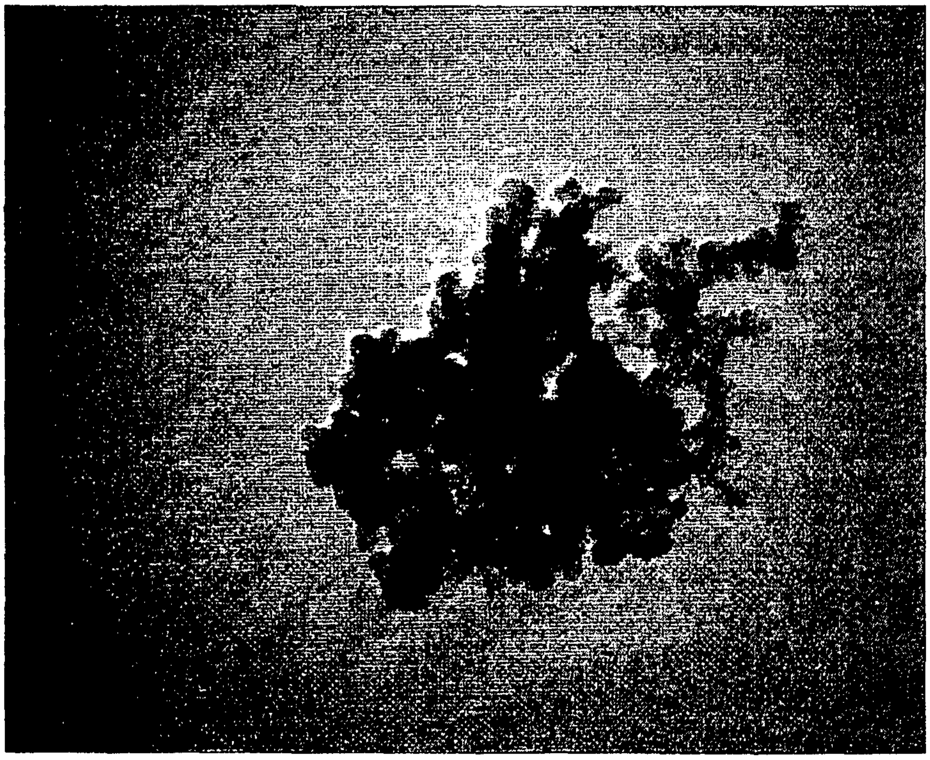

Figure 7. Transmission electron microscope image of aciniform carbon in sample 5735N1545 (75-5-2).

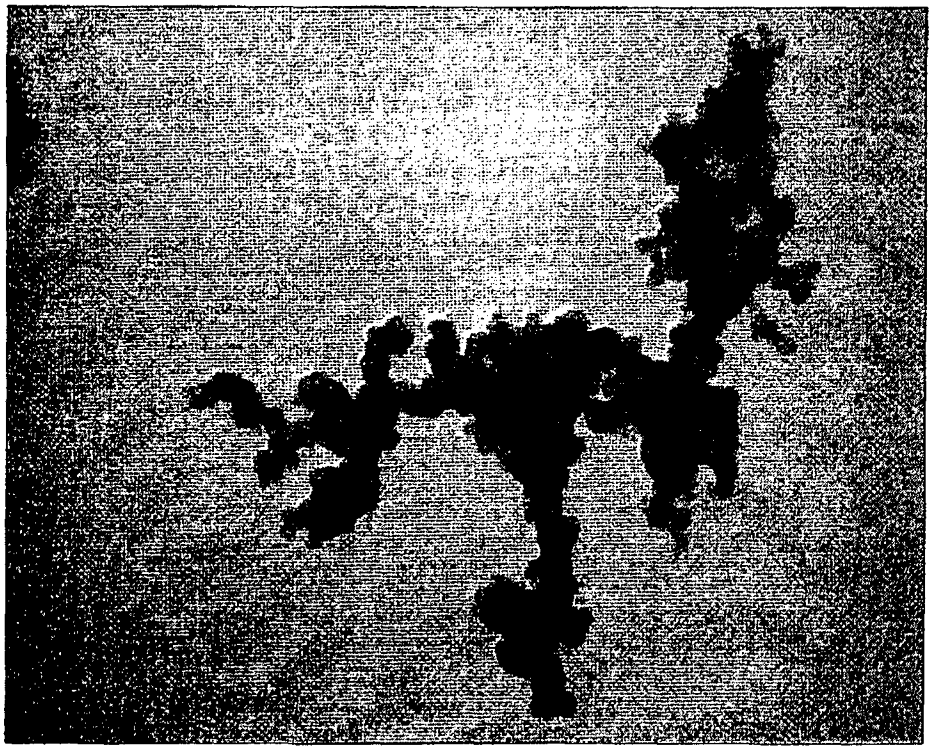

Figure 8. Transmission electron microscope image of aciniform carbon in sample 5735N1545 (75-5-2).

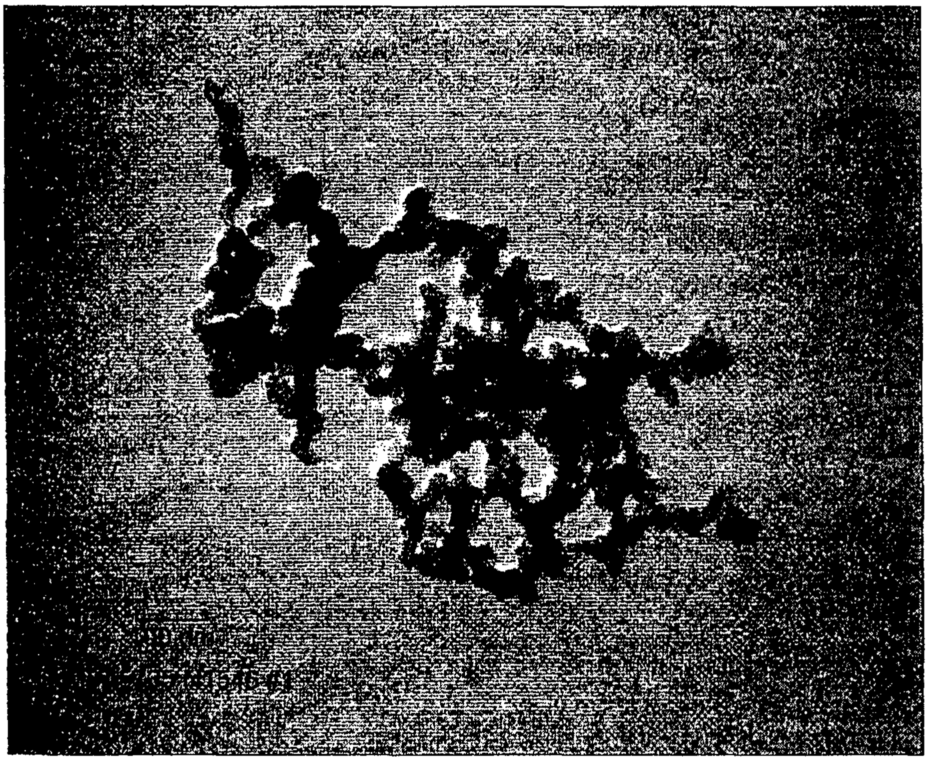

Figure 9. Transmission electron microscope image of aciniform carbon in sample 5735N1546 (100-5-2).

Figure 10. Transmission electron microscope image of aciniform carbon in sample 5735N1546 (100-5-2).

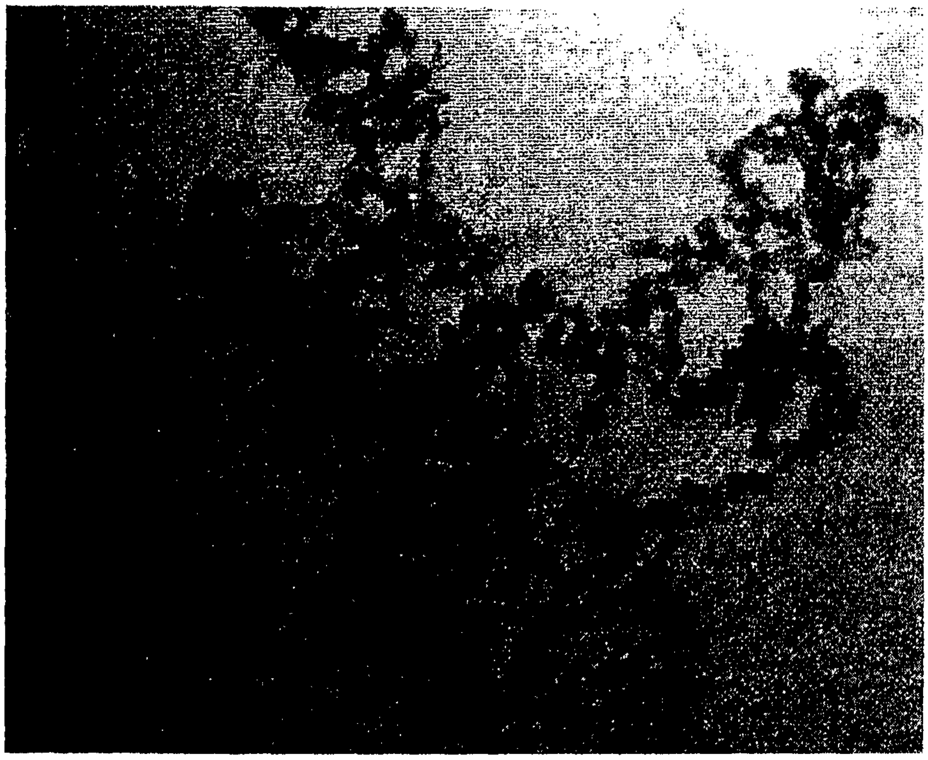

Figure 11. Transmission electron microscope image of aciniform carbon in sample 5735N1547 (L-5-3).

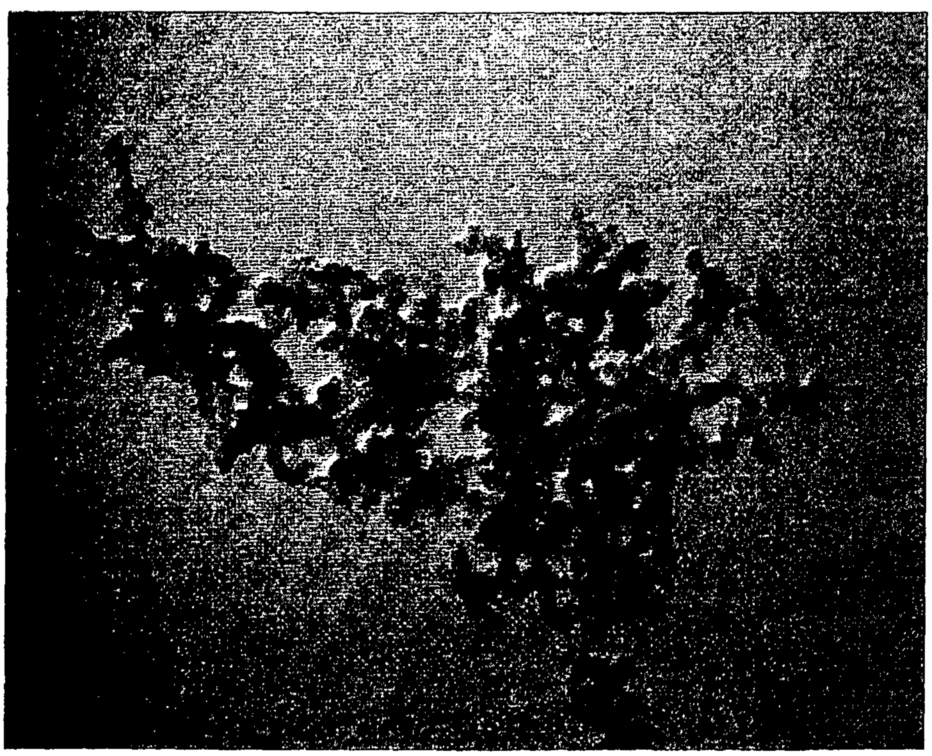

Figure 12. Transmission electron microscope image of aciniform carbon in sample 5735N1547 (L-5-3).

EQ Environmental Quality Management, Inc.

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

Reference Document No. A- 3111
Page 1 of 2

Project Name: Scott AFB
Project Number: 030174.0006.002
Project Manager: Tom Gerstle
Sample Team Leader: Ron Kolde

Lab Destination: MVA, Inc.
Lab Contact/Phone: Tim Vanderwood
Lab Purchase Order No.: 6378
Carrier/Waybill No.:

Report to: EQ- Tom Gerstle
1800 Carillon Blvd
Cincinnati OH 45240
(513) 825-7500 ext 251
Bill to: Same

ONE CONTAINER PER LINE

Sample Number	Sample Description/Type	Date/Time Collected	Container Type	Sample Volume	Preservative	Requested Analytical Method/(Parameters)	Condition on Receipt (Lab)
1542 10-5-2	Polycarbonate filter # PC025	9/8/03	Petri	Unknown	N/A	Particle size	
1543 25-5-2	" " PC-026	9/10/03	Dish	↓	↓	distribution by Scanning	
1544 50-5-2	" " PC-016	9/10/03				Electron Microscopy	
1545 75-5-2	" " PC-019	9/10/0				(SEM); Particle	
1546 100-5-2	" " PC-017	9/10/03				Morphology	

Special Instructions:
Particle size distribution and particle size morphology, qualitative description of particles.

Possible Hazard Identification:
Non-hazard ☒ Flammable ☐ Skin Irritant ☐ Other ____

Sample Disposal:
Return to Client ☐ Disposal by Lab ☒ Archive 6 (mos.)

Turnaround Time Required:
Normal ☒ Rush ☐ Results Required by ____

QA Requirements:

1. Relinquished by (Signature/Affiliation): Ron Kolde [signature] Date: 9/26/03 Time:

1. Received by (Signature/Affiliation): [signature], MVA Date: 9/29/03 Time: 10:45

2. Relinquished by (Signature/Affiliation): Date: Time:

2. Received by (Signature/Affiliation): Date: Time:

Comments:
Range of SEM: 1) 0.5 - <2.5 um 2) 2.5-<5.0 um 3) 5.0-7.5 um 4) 7.5-<10.0 um 5) >10.0 um

7IVA5735

Environmental Quality Management, Inc.

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD (cont.)

Reference Document No. 3111
Page 2 of 2

Project Name Scott AFB - 86 Generator/MF2 Testing
Project No. 030174.0006.002
Sample Shipment Date 9/26/03

ONE CONTAINER PER LINE

Sample Number	Sample Description/Type	Date/Time Collected	Container Type	Sample Volume	Pre-servative	Requested Analytical Method/(Parameters)	Condition on Receipt (Lab)
L-5-3	Filter No. PC-013	9/10/03	Petri Dish	unknown	N/A	Particle size	
Blank	Polycarbonate Filter	9/10/03	" "			distribution by SEM;	
						particle morphology	

AIR TOXICS LTD.

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Air Toxics Ltd. Introduces the Electronic Report

Thank you for choosing Air Toxics Ltd. To better serve our customers, we are providing your report by e-mail. This document is provided in Portable Document Format which can be viewed with Acrobat Reader by Adobe.

This electronic report includes the following:

- Work order Summary;
- Laboratory Narrative;
- Results; and
- Chain of Custody (copy).

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630

(916) 985-1000 .FAX (916) 985-1020
Hours 8:00 A.M to 6:00 P.M. Pacific
E-mail to:samplereceiving@airtoxics.com

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AN ENVIRONMENTAL ANALYTICAL LABORATORY

WORK ORDER #: 0309225

Work Order Summary

CLIENT:	Mr. Tom Gerstle Environmental Quality Management, Inc. 1800 Carillon Boulevard Cincinnati, OH 45240	**BILL TO:**	Mr Tom Gerstle Environmental Quality Management, Inc. 1800 Carillon Boulevard Cincinnati, OH 45240
PHONE:	800-229-7495 x 251	**P.O. #**	6169
FAX:	513-825-7495	**PROJECT #**	030174 0006.002 Scott AFB
DATE RECEIVED:	09/12/03	**CONTACT:**	DeDe Dodge
DATE COMPLETED:	09/21/03		

FRACTION #	NAME	TEST
01A	0030-1	Modified VOST 5041A/8260B
01B	0030-1	Modified VOST 5041A/8260B
02AB	0030-2	Modified VOST 5041A/8260B
03AB	0030-FB	Modified VOST 5041A/8260B
04AB	0030-RB	Modified VOST 5041A/8260B
05A	Lab Blank	Modified VOST 5041A/8260B
06A	LCS	Modified VOST 5041A/8260B

CERTIFIED BY: Linda d. Freeman DATE: 09/25/03

Laboratory Director

Certfication numbers: AR DEQ, CA NELAP - 02110CA, LA NELAP/LELAP- AI 30763, NJ NELAP - CA004
NY NELAP - 11291, UT NELAP - 9166389892
Name of Accrediting Agency: NELAP/Florida Department of Health, Scope of Application: Clean Air Act,
Accreditation number: E87680, Effective date: 07/01/03, Expiration date: 06/30/04
Air Toxics Ltd. certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
(916) 985-1000 . (800) 985-5955 FAX (916) 985-1020

LABORATORY NARRATIVE
VOST 5041A
Environmental Quality Management, Inc.
Workorder# 0309225

Two VOST Tube and three VOST Pair samples were received on September 12, 2003. The laboratory performed the analysis via EPA SW-846 Method 5041A using GC/MS in the full scan mode. VOST sorbent tubes are thermally desorbed at 180 degrees centigrade for ten minutes by UHP helium carrier gas. The gas stream is then bubbled through 5 mL of organic free water and trapped on the sorbent trap of the purge and trap system. The trap is thermally desorbed to elute the components into the GC/MS system for further separation. See the data sheets for the reporting limits for each compound.

Requirement	*VOST 5041A*	*ATL Modifications*
Batch Certification	Blanks from the same media as samples	Analysis of set of cartridges prior to onset of any project; Sampling media provided by the client is batch certified ahead of time, only if client provides blank cartridges.
Method blank	Cartridges from the same media batches as the samples	Media batch is certified prior to use in the field. Method Blank is used to certify instrument is contaminant free
Connection between cartridge thermal desorption apparatus & sample purge vessel	PTFE 1/16" Teflon tubing	Heated, 1/16" silica lined stainless steel tubing
Calibration Criteria for non-CCCs	RSD </= 15 % for all non-CCCs	RSD </= 30 % for some compounds: Acetone, Bromoform, Vinyl Acetate, Bromomethane, Chloromethane, 1,1,2,2-Tetracholoroethane, & 1,2,3-Trichloropropane

Receiving Notes

A Temperature Blank was included with the shipment. Temperature was measured and was not within 4 +/- 2 degrees C. Coolant in the form of blue ice was present. The client was notified via the login fax/email and the analysis proceeded.

Analytical Notes

The recovery of internal standard Fluorobenzene and Chlorobenzene-d5 in sample 0030-2 was outside control limits. It is not possible to re-run to confirm matrix or dilute for matrix using sorbent tube media. Data is reported as qualified.

Definition of Data Qualifying Flags

Seven qualifiers may have been used on the data analysis sheets and indicate as follows:

B - Compound present in laboratory blank or tube certification greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the detection limit.

N - The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates

as follows:
a-File was requantified
b-File was quantified by a second column and detector
r1-File was requantified for the purpose of reissue

AIR TOXICS LTD.

SAMPLE NAME: 0030-1

ID#: 0309225-01A

MODIFIED VOST 5041A/8260B

File Name: [illegible]	Date of Collection: 9/8/03
Dil. Factor: 1.00	Date of Analysis: 9/17/03 08:29 PM

Compound	Rpt. Limit (ng)	Amount (ng)
Chloromethane	10	Not Detected
Vinyl Chloride	10	Not Detected
Bromomethane	10	Not Detected
Chloroethane	10	Not Detected
Freon 11	10	Not Detected
2-Chloropropane	10	Not Detected
1,1-Dichloroethene	10	Not Detected
Freon 113	10	Not Detected
Carbon Disulfide	10	Not Detected
Acetone	50	740
3-Chloropropene	10	Not Detected
Methylene Chloride	10	350
trans-1,2-Dichloroethene	10	Not Detected
Acrylonitrile	10	Not Detected
Hexane	10	100
1,1-Dichloroethane	10	Not Detected
Vinyl Acetate	50	Not Detected
2,2-Dichloropropane	10	Not Detected
cis-1,2-Dichloroethene	10	Not Detected
2-Butanone (Methyl Ethyl Ketone)	50	190
Bromochloromethane	10	Not Detected
Chloroform	10	Not Detected
1,1,1-Trichloroethane	10	Not Detected
Carbon Tetrachloride	10	Not Detected
1,1-Dichloropropene	10	Not Detected
Benzene	10	1500 E
1,2-Dichloroethane	10	Not Detected
Trichloroethene	10	Not Detected
1,2-Dichloropropane	10	Not Detected
Dibromomethane	10	Not Detected
Bromodichloromethane	10	Not Detected
cis-1,3-Dichloropropene	10	Not Detected
trans-1,3-Dichloropropene	10	Not Detected
4-Methyl-2-pentanone (Methyl Isobutyl Ketone)	50	Not Detected
Toluene	10	740
1,1,2-Trichloroethane	10	Not Detected
Tetrachloroethene	10	Not Detected
1,3-Dichloropropane	10	Not Detected
2-Hexanone	50	Not Detected
Dibromochloromethane	10	Not Detected
Chlorobenzene	10	Not Detected
1,2-Dibromoethane (EDB)	10	Not Detected

AIR TOXICS LTD.

SAMPLE NAME: 0030-1

ID#: 0309225-01A

MODIFIED VOST 5041A/8260B

File Name:	[illegible]	Date of Collection:	[illegible]
Dil. Factor:	[illegible]	Date of Analysis:	9/17/03 06:29 PM

Compound	Rpt. Limit (ng)	Amount (ng)
Ethyl Benzene	10	440
m,p-Xylene	10	820
o-Xylene	10	350
Styrene	10	Not Detected
Bromoform	10	Not Detected
1,1,2,2-Tetrachloroethane	10	Not Detected
1,3-Dichlorobenzene	10	Not Detected
1,4-Dichlorobenzene	10	Not Detected
1,2-Dichlorobenzene	10	Not Detected
Cumene	10	230
cis-1,4-Dichloro-2-butene	50	Not Detected
Bromobenzene	10	Not Detected
1,2,3-Trichloropropane	10	Not Detected
trans-1,4-Dichloro-2-butene	50	Not Detected
Propylbenzene	10	360
2-Chlorotoluene	10	Not Detected
4-Chlorotoluene	10	Not Detected
1,3,5-Trimethylbenzene	10	240
tert-Butylbenzene	10	Not Detected
1,2,4-Trimethylbenzene	10	800
sec-Butylbenzene	10	320
p-Cymene	10	170
1,2-Dibromo-3-chloropropane	50	Not Detected
1,2,4-Trichlorobenzene	50	Not Detected
Naphthalene	50	480
Hexachlorobutadiene	50	Not Detected
1,2,3-Trichlorobenzene	50	Not Detected
1,1,1,2-Tetrachloroethane	10	Not Detected
Butylbenzene	10	Not Detected
Iodomethane	10	Not Detected
Freon 12	10	Not Detected

E = Exceeds instrument calibration range

Container Type: VOST Tube

Surrogates	%Recovery	Method Limits
Dibromofluoromethane	93	70-130
1,2-Dichloroethane-d4	99	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	111	70-130

AIR TOXICS LTD.

SAMPLE NAME: 0030-1

ID#: 0309225-01B

MODIFIED VOST 5041A/8260B

File Name:	[illegible]z091707	Date of Collection: 9/8/03
Dil. Factor:	1.00	Date of Analysis: 9/17/03 05:54 PM

Compound	Rpt. Limit (ng)	Amount (ng)
Chloromethane	10	Not Detected
Vinyl Chloride	10	Not Detected
Bromomethane	10	130
Chloroethane	10	Not Detected
Freon 11	10	Not Detected
2-Chloropropane	10	Not Detected
1,1-Dichloroethene	10	Not Detected
Freon 113	10	Not Detected
Carbon Disulfide	10	Not Detected
Acetone	50	96
3-Chloropropene	10	Not Detected
Methylene Chloride	10	54
trans-1,2-Dichloroethene	10	Not Detected
Acrylonitrile	10	Not Detected
Hexane	10	Not Detected
1,1-Dichloroethane	10	Not Detected
Vinyl Acetate	50	Not Detected
2,2-Dichloropropane	10	Not Detected
cis-1,2-Dichloroethene	10	Not Detected
2-Butanone (Methyl Ethyl Ketone)	50	Not Detected
Bromochloromethane	10	Not Detected
Chloroform	10	Not Detected
1,1,1-Trichloroethane	10	Not Detected
Carbon Tetrachloride	10	Not Detected
1,1-Dichloropropene	10	Not Detected
Benzene	10	22
1,2-Dichloroethane	10	Not Detected
Trichloroethene	10	Not Detected
1,2-Dichloropropane	10	Not Detected
Dibromomethane	10	Not Detected
Bromodichloromethane	10	Not Detected
cis-1,3-Dichloropropene	10	Not Detected
trans-1,3-Dichloropropene	10	Not Detected
4-Methyl-2-pentanone (Methyl Isobutyl Ketone)	50	Not Detected
Toluene	10	Not Detected
1,1,2-Trichloroethane	10	Not Detected
Tetrachloroethene	10	Not Detected
1,3-Dichloropropane	10	Not Detected
2-Hexanone	50	Not Detected
Dibromochloromethane	10	Not Detected
Chlorobenzene	10	Not Detected
1,2-Dibromoethane (EDB)	10	Not Detected

AIR TOXICS LTD.

SAMPLE NAME: 0030-1

ID#: 0309225-01B

MODIFIED VOST 5041A/8260B

File Name: [illegible]	Date of Collection: 9/8/03
Dil. Factor: [illegible]	Date of Analysis: 9/17/03 05:54 PM

Compound	Rpt. Limit (ng)	Amount (ng)
Ethyl Benzene	10	Not Detected
m,p-Xylene	10	18
o-Xylene	10	Not Detected
Styrene	10	Not Detected
Bromoform	10	Not Detected
1,1,2,2-Tetrachloroethane	10	Not Detected
1,3-Dichlorobenzene	10	Not Detected
1,4-Dichlorobenzene	10	Not Detected
1,2-Dichlorobenzene	10	Not Detected
Cumene	10	Not Detected
cis-1,4-Dichloro-2-butene	50	Not Detected
Bromobenzene	10	Not Detected
1,2,3-Trichloropropane	10	Not Detected
trans-1,4-Dichloro-2-butene	50	Not Detected
Propylbenzene	10	Not Detected
2-Chlorotoluene	10	Not Detected
4-Chlorotoluene	10	Not Detected
1,3,5-Trimethylbenzene	10	Not Detected
tert-Butylbenzene	10	Not Detected
1,2,4-Trimethylbenzene	10	Not Detected
sec-Butylbenzene	10	Not Detected
p-Cymene	10	Not Detected
1,2-Dibromo-3-chloropropane	50	Not Detected
1,2,4-Trichlorobenzene	50	Not Detected
Naphthalene	50	Not Detected
Hexachlorobutadiene	50	Not Detected
1,2,3-Trichlorobenzene	50	Not Detected
1,1,1,2-Tetrachloroethane	10	Not Detected
Butylbenzene	10	Not Detected
Iodomethane	10	31
Freon 12	10	Not Detected

Container Type: VOST Tube

Surrogates	%Recovery	Method Limits
Dibromofluoromethane	98	70-130
1,2-Dichloroethane-d4	102	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	100	70-130

AIR TOXICS LTD.

SAMPLE NAME: 0030-2

ID#: 0309225-02AB

MODIFIED VOST 5041A/8260B

File Name:	[illegible]	Date of Collection:	9/10/03
Dil. Factor:	1.00	Date of Analysis:	9/17/03 08:42 PM

Compound	Rpt. Limit (ng)	Amount (ng)
Chloromethane	10	Not Detected
Vinyl Chloride	10	Not Detected
Bromomethane	10	11
Chloroethane	10	Not Detected
Freon 11	10	Not Detected
2-Chloropropane	10	Not Detected
1,1-Dichloroethene	10	Not Detected
Freon 113	10	Not Detected
Carbon Disulfide	10	Not Detected
Acetone	50	420
3-Chloropropene	10	Not Detected
Methylene Chloride	10	550
trans-1,2-Dichloroethene	10	Not Detected
Acrylonitrile	10	Not Detected
Hexane	10	79
1,1-Dichloroethane	10	Not Detected
Vinyl Acetate	50	Not Detected
2,2-Dichloropropane	10	Not Detected
cis-1,2-Dichloroethene	10	Not Detected
2-Butanone (Methyl Ethyl Ketone)	50	460
Bromochloromethane	10	Not Detected
Chloroform	10	Not Detected
1,1,1-Trichloroethane	10	Not Detected
Carbon Tetrachloride	10	Not Detected
1,1-Dichloropropene	10	Not Detected
Benzene	10	3400 E
1,2-Dichloroethane	10	Not Detected
Trichloroethene	10	Not Detected
1,2-Dichloropropane	10	Not Detected
Dibromomethane	10	Not Detected
Bromodichloromethane	10	Not Detected
cis-1,3-Dichloropropene	10	Not Detected
trans-1,3-Dichloropropene	10	Not Detected
4-Methyl-2-pentanone (Methyl Isobutyl Ketone)	50	Not Detected
Toluene	10	1400 E
1,1,2-Trichloroethane	10	Not Detected
Tetrachloroethene	10	Not Detected
1,3-Dichloropropane	10	Not Detected
2-Hexanone	50	Not Detected
Dibromochloromethane	10	Not Detected
Chlorobenzene	10	Not Detected
1,2-Dibromoethane (EDB)	10	Not Detected

AIR TOXICS LTD.

SAMPLE NAME: 0030-2

ID#: 0309225-02AB

MODIFIED VOST 5041A/8260B

File Name: [illegible]	Date of Collection: 9/10/03
Dil. Factor: [illegible]	Date of Analysis: 9/17/03 08:42 PM

Compound	Rpt. Limit (ng)	Amount (ng)
Ethyl Benzene	10	520
m,p-Xylene	10	1200
o-Xylene	10	570
Styrene	10	Not Detected
Bromoform	10	Not Detected
1,1,2,2-Tetrachloroethane	10	Not Detected
1,3-Dichlorobenzene	10	Not Detected
1,4-Dichlorobenzene	10	Not Detected
1,2-Dichlorobenzene	10	Not Detected
Cumene	10	210
cis-1,4-Dichloro-2-butene	50	Not Detected
Bromobenzene	10	Not Detected
1,2,3-Trichloropropane	10	Not Detected
trans-1,4-Dichloro-2-butene	50	Not Detected
Propylbenzene	10	390
2-Chlorotoluene	10	Not Detected
4-Chlorotoluene	10	Not Detected
1,3,5-Trimethylbenzene	10	430
tert-Butylbenzene	10	Not Detected
1,2,4-Trimethylbenzene	10	1400 E
sec-Butylbenzene	10	320
p-Cymene	10	220
1,2-Dibromo-3-chloropropane	50	Not Detected
1,2,4-Trichlorobenzene	50	Not Detected
Naphthalene	50	1700 E
Hexachlorobutadiene	50	Not Detected
1,2,3-Trichlorobenzene	50	Not Detected
1,1,1,2-Tetrachloroethane	10	Not Detected
Butylbenzene	10	Not Detected
Iodomethane	10	Not Detected
Freon 12	10	Not Detected

E = Exceeds instrument calibration range.

Container Type: VOST Pair

Surrogates	%Recovery	Method Limits
Dibromofluoromethane	88	70-130
1,2-Dichloroethane-d4	98	70-130
Toluene-d8	96	70-130
4-Bromofluorobenzene	109	70-130

AIR TOXICS LTD.

SAMPLE NAME: 0030-FB

ID#: 0309225-03AB

MODIFIED VOST 5041A/8260B

File Name:	z091705	Date of Collection:	9/10/03
Dil. Factor:	1.00	Date of Analysis:	9/17/03 04:41 PM

Compound	Rpt. Limit (ng)	Amount (ng)
Chloromethane	10	Not Detected
Vinyl Chloride	10	Not Detected
Bromomethane	10	Not Detected
Chloroethane	10	Not Detected
Freon 11	10	Not Detected
2-Chloropropane	10	Not Detected
1,1-Dichloroethene	10	Not Detected
Freon 113	10	Not Detected
Carbon Disulfide	10	Not Detected
Acetone	50	110
3-Chloropropene	10	Not Detected
Methylene Chloride	10	11
trans-1,2-Dichloroethene	10	Not Detected
Acrylonitrile	10	Not Detected
Hexane	10	Not Detected
1,1-Dichloroethane	10	Not Detected
Vinyl Acetate	50	Not Detected
2,2-Dichloropropane	10	Not Detected
cis-1,2-Dichloroethene	10	Not Detected
2-Butanone (Methyl Ethyl Ketone)	50	Not Detected
Bromochloromethane	10	Not Detected
Chloroform	10	Not Detected
1,1,1-Trichloroethane	10	Not Detected
Carbon Tetrachloride	10	Not Detected
1,1-Dichloropropene	10	Not Detected
Benzene	10	22
1,2-Dichloroethane	10	Not Detected
Trichloroethene	10	Not Detected
1,2-Dichloropropane	10	Not Detected
Dibromomethane	10	Not Detected
Bromodichloromethane	10	Not Detected
cis-1,3-Dichloropropene	10	Not Detected
trans-1,3-Dichloropropene	10	Not Detected
4-Methyl-2-pentanone (Methyl Isobutyl Ketone)	50	Not Detected
Toluene	10	Not Detected
1,1,2-Trichloroethane	10	Not Detected
Tetrachloroethene	10	Not Detected
1,3-Dichloropropane	10	Not Detected
2-Hexanone	50	Not Detected
Dibromochloromethane	10	Not Detected
Chlorobenzene	10	Not Detected
1,2-Dibromoethane (EDB)	10	Not Detected

AIR TOXICS LTD.

SAMPLE NAME: 0030-FB

ID#: 0309225-03AB

MODIFIED VOST 5041A/8260B

File Name: [illegible]	Date of Collection: 9/10/03
Dil. Factor: 1.00	Date of Analysis: 9/17/03 04:41 PM

Compound	Rpt. Limit (ng)	Amount (ng)
Ethyl Benzene	10	Not Detected
m,p-Xylene	10	Not Detected
o-Xylene	10	Not Detected
Styrene	10	Not Detected
Bromoform	10	Not Detected
1,1,2,2-Tetrachloroethane	10	Not Detected
1,3-Dichlorobenzene	10	Not Detected
1,4-Dichlorobenzene	10	Not Detected
1,2-Dichlorobenzene	10	Not Detected
Cumene	10	Not Detected
cis-1,4-Dichloro-2-butene	50	Not Detected
Bromobenzene	10	Not Detected
1,2,3-Trichloropropane	10	Not Detected
trans-1,4-Dichloro-2-butene	50	Not Detected
Propylbenzene	10	Not Detected
2-Chlorotoluene	10	Not Detected
4-Chlorotoluene	10	Not Detected
1,3,5-Trimethylbenzene	10	Not Detected
tert-Butylbenzene	10	Not Detected
1,2,4-Trimethylbenzene	10	Not Detected
sec-Butylbenzene	10	Not Detected
p-Cymene	10	Not Detected
1,2-Dibromo-3-chloropropane	50	Not Detected
1,2,4-Trichlorobenzene	50	Not Detected
Naphthalene	50	Not Detected
Hexachlorobutadiene	50	Not Detected
1,2,3-Trichlorobenzene	50	Not Detected
1,1,1,2-Tetrachloroethane	10	Not Detected
Butylbenzene	10	Not Detected
Iodomethane	10	Not Detected
Freon 12	10	Not Detected

Container Type: VOST Pair

Surrogates	%Recovery	Method Limits
Dibromofluoromethane	100	70-130
1,2-Dichloroethane-d4	107	70-130
Toluene-d8	101	70-130
4-Bromofluorobenzene	98	70-130

AIR TOXICS LTD.

SAMPLE NAME: 0030-RB

ID#: 0309225-04AB

MODIFIED VOST 5041A/8260B

File Name: [illegible]2091706	Date of Collection: 9/10/03
Dil. Factor: [illegible]	Date of Analysis: 9/17/03 05:19 PM

Compound	Rpt. Limit (ng)	Amount (ng)
Chloromethane	10	Not Detected
Vinyl Chloride	10	Not Detected
Bromomethane	10	Not Detected
Chloroethane	10	Not Detected
Freon 11	10	Not Detected
2-Chloropropane	10	Not Detected
1,1-Dichloroethene	10	Not Detected
Freon 113	10	Not Detected
Carbon Disulfide	10	20
Acetone	50	Not Detected
3-Chloropropene	10	Not Detected
Methylene Chloride	10	28
trans-1,2-Dichloroethene	10	Not Detected
Acrylonitrile	10	Not Detected
Hexane	10	Not Detected
1,1-Dichloroethane	10	Not Detected
Vinyl Acetate	50	Not Detected
2,2-Dichloropropane	10	Not Detected
cis-1,2-Dichloroethene	10	Not Detected
2-Butanone (Methyl Ethyl Ketone)	50	Not Detected
Bromochloromethane	10	Not Detected
Chloroform	10	Not Detected
1,1,1-Trichloroethane	10	Not Detected
Carbon Tetrachloride	10	Not Detected
1,1-Dichloropropene	10	Not Detected
Benzene	10	Not Detected
1,2-Dichloroethane	10	Not Detected
Trichloroethene	10	Not Detected
1,2-Dichloropropane	10	Not Detected
Dibromomethane	10	Not Detected
Bromodichloromethane	10	Not Detected
cis-1,3-Dichloropropene	10	Not Detected
trans-1,3-Dichloropropene	10	Not Detected
4-Methyl-2-pentanone (Methyl Isobutyl Ketone)	50	Not Detected
Toluene	10	Not Detected
1,1,2-Trichloroethane	10	Not Detected
Tetrachloroethene	10	Not Detected
1,3-Dichloropropane	10	Not Detected
2-Hexanone	50	Not Detected
Dibromochloromethane	10	Not Detected
Chlorobenzene	10	Not Detected
1,2-Dibromoethane (EDB)	10	Not Detected

AIR TOXICS LTD.

SAMPLE NAME: 0030-RB

ID#: 0309225-04AB

MODIFIED VOST 5041A/8260B

File Name: [illegible]	Date of Collection: 9/10/03
Dil. Factor: 1.00	Date of Analysis: 9/17/03 05:19 PM

Compound	Rpt. Limit (ng)	Amount (ng)
Ethyl Benzene	10	Not Detected
m,p-Xylene	10	Not Detected
o-Xylene	10	Not Detected
Styrene	10	Not Detected
Bromoform	10	Not Detected
1,1,2,2-Tetrachloroethane	10	Not Detected
1,3-Dichlorobenzene	10	Not Detected
1,4-Dichlorobenzene	10	Not Detected
1,2-Dichlorobenzene	10	Not Detected
Cumene	10	Not Detected
cis-1,4-Dichloro-2-butene	50	Not Detected
Bromobenzene	10	Not Detected
1,2,3-Trichloropropane	10	Not Detected
trans-1,4-Dichloro-2-butene	50	Not Detected
Propylbenzene	10	Not Detected
2-Chlorotoluene	10	Not Detected
4-Chlorotoluene	10	Not Detected
1,3,5-Trimethylbenzene	10	Not Detected
tert-Butylbenzene	10	Not Detected
1,2,4-Trimethylbenzene	10	Not Detected
sec-Butylbenzene	10	Not Detected
p-Cymene	10	Not Detected
1,2-Dibromo-3-chloropropane	50	Not Detected
1,2,4-Trichlorobenzene	50	Not Detected
Naphthalene	50	Not Detected
Hexachlorobutadiene	50	Not Detected
1,2,3-Trichlorobenzene	50	Not Detected
1,1,1,2-Tetrachloroethane	10	Not Detected
Butylbenzene	10	Not Detected
Iodomethane	10	Not Detected
Freon 12	10	Not Detected

Container Type: VOST Pair

Surrogates	%Recovery	Method Limits
Dibromofluoromethane	101	70-130
1,2-Dichloroethane-d4	106	70-130
Toluene-d8	95	70-130
4-Bromofluorobenzene	100	70-130

AIR TOXICS LTD.

SAMPLE NAME: Lab Blank

ID#: 0309225-05A

MODIFIED VOST 5041A/8260B

File Name:	2091704	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 9/17/03 03:54 PM

Compound	Rpt. Limit (ng)	Amount (ng)
Chloromethane	10	Not Detected
Vinyl Chloride	10	Not Detected
Bromomethane	10	Not Detected
Chloroethane	10	Not Detected
Freon 11	10	Not Detected
2-Chloropropane	10	Not Detected
1,1-Dichloroethene	10	Not Detected
Freon 113	10	Not Detected
Carbon Disulfide	10	Not Detected
Acetone	50	Not Detected
3-Chloropropene	10	Not Detected
Methylene Chloride	10	Not Detected
trans-1,2-Dichloroethene	10	Not Detected
Acrylonitrile	10	Not Detected
Hexane	10	Not Detected
1,1-Dichloroethane	10	Not Detected
Vinyl Acetate	50	Not Detected
2,2-Dichloropropane	10	Not Detected
cis-1,2-Dichloroethene	10	Not Detected
2-Butanone (Methyl Ethyl Ketone)	50	Not Detected
Bromochloromethane	10	Not Detected
Chloroform	10	Not Detected
1,1,1-Trichloroethane	10	Not Detected
Carbon Tetrachloride	10	Not Detected
1,1-Dichloropropene	10	Not Detected
Benzene	10	Not Detected
1,2-Dichloroethane	10	Not Detected
Trichloroethene	10	Not Detected
1,2-Dichloropropane	10	Not Detected
Dibromomethane	10	Not Detected
Bromodichloromethane	10	Not Detected
cis-1,3-Dichloropropene	10	Not Detected
trans-1,3-Dichloropropene	10	Not Detected
4-Methyl-2-pentanone (Methyl Isobutyl Ketone)	50	Not Detected
Toluene	10	Not Detected
1,1,2-Trichloroethane	10	Not Detected
Tetrachloroethene	10	Not Detected
1,3-Dichloropropane	10	Not Detected
2-Hexanone	50	Not Detected
Dibromochloromethane	10	Not Detected
Chlorobenzene	10	Not Detected
1,2-Dibromoethane (EDB)	10	Not Detected

AIR TOXICS LTD.

SAMPLE NAME: Lab Blank

ID#: 0309225-05A

MODIFIED VOST 5041A/8260B

File Name: [illegible]	Date of Collection: NA
Dil. Factor: [illegible]	Date of Analysis: 9/17/03 03:54 PM

Compound	Rpt. Limit (ng)	Amount (ng)
Ethyl Benzene	10	Not Detected
m,p-Xylene	10	Not Detected
o-Xylene	10	Not Detected
Styrene	10	Not Detected
Bromoform	10	Not Detected
1,1,2,2-Tetrachloroethane	10	Not Detected
1,3-Dichlorobenzene	10	Not Detected
1,4-Dichlorobenzene	10	Not Detected
1,2-Dichlorobenzene	10	Not Detected
Cumene	10	Not Detected
cis-1,4-Dichloro-2-butene	50	Not Detected
Bromobenzene	10	Not Detected
1,2,3-Trichloropropane	10	Not Detected
trans-1,4-Dichloro-2-butene	50	Not Detected
Propylbenzene	10	Not Detected
2-Chlorotoluene	10	Not Detected
4-Chlorotoluene	10	Not Detected
1,3,5-Trimethylbenzene	10	Not Detected
tert-Butylbenzene	10	Not Detected
1,2,4-Trimethylbenzene	10	Not Detected
sec-Butylbenzene	10	Not Detected
p-Cymene	10	Not Detected
1,2-Dibromo-3-chloropropane	50	Not Detected
1,2,4-Trichlorobenzene	50	Not Detected
Naphthalene	50	Not Detected
Hexachlorobutadiene	50	Not Detected
1,2,3-Trichlorobenzene	50	Not Detected
1,1,1,2-Tetrachloroethane	10	Not Detected
Butylbenzene	10	Not Detected
Iodomethane	10	Not Detected
Freon 12	10	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Dibromofluoromethane	100	70-130
1,2-Dichloroethane-d4	107	70-130
Toluene-d8	101	70-130
4-Bromofluorobenzene	99	70-130

AIR TOXICS LTD.

SAMPLE NAME: LCS

ID#: 0309225-06A

MODIFIED VOST 5041A/8260B

File Name: [illegible] 9091703 [illegible] Date of Collection: NA
Dil. Factor: [illegible] Date of Analysis: 9/17/03 03:10 PM

Compound	%Recovery
Chloromethane	66
Vinyl Chloride	66
Bromomethane	66
Chloroethane	80
Freon 11	74
2-Chloropropane	Not Spiked
1,1-Dichloroethene	81
Freon 113	Not Spiked
Carbon Disulfide	94
Acetone	85
3-Chloropropene	Not Spiked
Methylene Chloride	74
trans-1,2-Dichloroethene	75
Acrylonitrile	Not Spiked
Hexane	Not Spiked
1,1-Dichloroethane	79
Vinyl Acetate	Not Spiked
2,2-Dichloropropane	75
cis-1,2-Dichloroethene	74
2-Butanone (Methyl Ethyl Ketone)	62
Bromochloromethane	82
Chloroform	82
1,1,1-Trichloroethane	84
Carbon Tetrachloride	84
1,1-Dichloropropene	80
Benzene	81
1,2-Dichloroethane	86
Trichloroethene	89
1,2-Dichloropropane	80
Dibromomethane	79
Bromodichloromethane	82
cis-1,3-Dichloropropene	74
trans-1,3-Dichloropropene	80
4-Methyl-2-pentanone (Methyl Isobutyl Ketone)	65
Toluene	86
1,1,2-Trichloroethane	83
Tetrachloroethene	88
1,3-Dichloropropane	84
2-Hexanone	50
Dibromochloromethane	86
Chlorobenzene	88
1,2-Dibromoethane (EDB)	81

AIR TOXICS LTD.

SAMPLE NAME: LCS

ID#: 0309225-06A

MODIFIED VOST 5041A/8260B

File Name:	[illegible]	Date of Collection: NA	
Dil. Factor:	1.00	Date of Analysis: 9/17/03 03:10 PM	

Compound	%Recovery
Ethyl Benzene	88
m,p-Xylene	91
o-Xylene	90
Styrene	93
Bromoform	85
1,1,2,2-Tetrachloroethane	71
1,3-Dichlorobenzene	86
1,4-Dichlorobenzene	88
1,2-Dichlorobenzene	88
Cumene	89
cis-1,4-Dichloro-2-butene	Not Spiked
Bromobenzene	85
1,2,3-Trichloropropane	87
trans-1,4-Dichloro-2-butene	Not Spiked
Propylbenzene	85
2-Chlorotoluene	83
4-Chlorotoluene	80
1,3,5-Trimethylbenzene	84
tert-Butylbenzene	84
1,2,4-Trimethylbenzene	85
sec-Butylbenzene	86
p-Cymene	87
1,2-Dibromo-3-chloropropane	78
1,2,4-Trichlorobenzene	91
Naphthalene	114
Hexachlorobutadiene	96
1,2,3-Trichlorobenzene	109
1,1,1,2-Tetrachloroethane	92
Butylbenzene	83
Iodomethane	Not Spiked
Freon 12	79

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Dibromofluoromethane	98	70-130
1,2-Dichloroethane-d4	108	70-130
Toluene-d8	104	70-130
4-Bromofluorobenzene	99	70-130

EQ **Environmental Quality Management, Inc.**

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

0309225

Reference Document No. A- 3107
Page 1 of 1

- 86 Generator Testing

Project Name: Scott AFB
Project Number: 030174.0002.002
Project Manager: Tom Gerstle
Sample Team Leader: Ron Kolde

Lab Destination: Air Toxics
Lab Contact/Phone: Dede Dodge 916-985-1000
Lab Purchase Order No.: 6169
Carrier/Waybill No.:

Report to: Tom Gerstle, EQ
1800 Carillon Blvd
Cincinnati, OH 45240
800-229-9475
Bill to: Same

ONE CONTAINER PER LINE

	Sample Number	Sample Description/Type	Date/Time Collected	Container Type	Sample Volume	Preservative	Requested Analytical Method/(Parameters)	Condition on Receipt (Lab)
01AB	0030-1	Tenax, Tenax / CharCoal	9/8/03 – 9/10/03	Glass	N/A	Ice	EPA Method 0030	
02AB	0030-2	" "	9/10/03	↓	↓	↓	For Volatile Organic	
03AB	0030-FB	" "	9/10/03				Compounds	
04AB	0030-RB	" "	9/10/03					

Special Instructions:

Possible Hazard Identification:
Non-hazard ☒ Flammable ☐ Skin Irritant ☐ Other ______

Sample Disposal:
Return to Client ☐ Disposal by Lab ☒ Archive 6 (mos.)

Turnaround Time Required:
Normal ☒ Rush ☐ Results Required by ______

QA Requirements:
As per Method 0030

1. Relinquished by (Signature/Affiliation): Ron Kolde Ronald J. Kolde — Date: 9/11/03 Time:

1. Received by (Signature/Affiliation): — Date: Time:

2. Relinquished by (Signature/Affiliation): — Date: Time:

2. Received by (Signature/Affiliation): Laura Thomas ATL — Date: 9/12/03 Time: 930

Comments:

CUSTODY SEAL INTACT?
Y N NONE TEMP 14.4 °C

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AN ENVIRONMENTAL ANALYTICAL LABORATORY

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This electronic report includes the following:

- Work order Summary;
- Laboratory Narrative;
- Results; and
- Chain of Custody (copy).

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Hours 8:00 A.M to 6:00 P.M. Pacific
E-mail to:samplereceiving@airtoxics.com

@ AIR TOXICS LTD.

AN ENVIRONMENTAL ANALYTICAL LABORATORY

WORK ORDER #: 0309224

Work Order Summary

CLIENT:	Mr Tom Gerstle Environmental Quality Management, Inc. 1800 Carillon Boulevard Cincinnati, OH 45240	**BILL TO:**	Mr. Tom Gerstle Environmental Quality Management, Inc. 1800 Carillon Boulevard Cincinnati, OH 45240
PHONE:	800-229-7495 x 251	**P.O. #**	6169
FAX:	513-825-7495	**PROJECT #**	030174.0006.002 Scott AFB
DATE RECEIVED:	9/12/03	**CONTACT:**	DeDe Dodge
DATE COMPLETED:	9/25/03		

FRACTION #	NAME	TEST
01AB	5515-1	Modified NIOSH 5515
02AB	5515-2	Modified NIOSH 5515
03AB	5515-FB	Modified NIOSH 5515
04AB	5515-RB	Modified NIOSH 5515
05A	Lab Blank	Modified NIOSH 5515
06A	LCS	Modified NIOSH 5515

CERTIFIED BY: Linda L. Freeman DATE: 09/25/03

Laboratory Director

Certfication numbers: AR DEQ, CA NELAP - 02110CA, LA NELAP/LELAP- AI 30763, NJ NELAP - CA004
NY NELAP - 11291, UT NELAP - 9166389892
Name of Accrediting Agency: NELAP/Florida Department of Health, Scope of Application: Clean Air Act,
Accreditation number: E87680, Effective date: 07/01/03, Expiration date: 06/30/04
Air Toxics Ltd. certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
Modified NIOSH 5515
Environmental Quality Management, Inc.
Workorder# 0309224

Four NIOSH Tubes XAD-2 w/Filter samples were received on September 12, 2003. The laboratory performed the analysis for Polyaromatic Hydrocarbons (PAHs) via Modified NIOSH Method 5515. The method involves solvent desorption using Methylene Chloride, followed by separation and analysis using GC/MS. See the data sheets for the reporting limits for each compound.

Requirement	*NIOSH 5515*	*ATL Modifications*
Target compounds	List includes Benzo(e)pyrene.	Standard list does not include Benzo(e)pyrene
Determination of Optimal Solvent	Test is performed on sample filters to determine optimal solvent: Acetonitrile, Benzene, Cyclohexane, or Methylene Chloride.	Methylene Chloride is used as the extraction solvent for all samples.
Standard preparation	Standards are prepared in Toluene using neat compounds.	Commercially available standard mixes in methylene chloride are used.
Calibration range	Suggested range of 0.005 to 5 ug/mL.	Range is approximately 1.0 to 160 ug/mL.
Recovery study for filter	For each filter lot, spike 4 filters at each of the 5 calibration levels. Extract, analyze, and calculate recovery.	Not performed unless requested.
Laboratory Control Spikes	With each analytical batch, spike and extract duplicate filters and tubes If recovery varies by more than +/-5% from the recovery and desorption efficiency study results, than repeat the studies.	Spike filter and tube with each batch Acceptance criterion is 50%-150%.
Lab Blank	Analyze at least three field blanks for each sample medium. Average blank level is subtracted from the sample results.	One lab blank is analyzed per batch; no blank subtraction is performed.
Concentration calculations	Results are corrected for %Recovery and desorption efficiency.	No correction of results performed. A copy of the desorption study is available upon request.
Units	The air concentration in mg/m3 is reported.	Standard reporting unit is mass concentration (ug)
Detector	Flame Ionization Detector (FID)	Mass Spectrometer (MS)

Receiving Notes

A Temperature Blank was included with the shipment. Temperature was measured and was not within 4 +/- 2 degrees C. Coolant in the form of blue ice was present. The client was notified via the login fax/email and the analysis proceeded.

Analytical Notes

The front tubes, back tubes and filters were extracted and analyzed separately to monitor for possible breakthrough. Analytical results from only the front tubes were reported since no breakthrough was observed. The reported surrogate recoveries are derived from the front portions of each tube analysis only.

Sample results are not corrected for the desorption efficiency.

Definition of Data Qualifying Flags

Six qualifiers may have been used on the data analysis sheets and indicate as follows:
B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).
J - Estimated value.
E - Exceeds instrument calibration range.
S - Saturated peak.
Q - Exceeds quality control limits.
U - Compound analyzed for but not detected above the detection limit.

File extensions may have been used on the data analysis sheets and indicates as follows:
a-File was requantified
b-File was quantified by a second column and detector
r1-File was requantified for the purpose of reissue

AIR TOXICS LTD.

SAMPLE NAME: 5515-1

ID#: 0309224-01AB

MODIFIED NIOSH METHOD 5515 GC/MS

File Name: [illegible] Date of Collection: 9/8/03
Dil. Factor: [illegible] Date of Analysis: 9/25/03 11:29 AM
[illegible] Date of Extraction: 9/24/03

Compound	Rpt. Limit (ug)	Amount (ug)
Naphthalene	2.0	- Not Detected
2-Methylnaphthalene	2.0	Not Detected
2-Chloronaphthalene	2.0	Not Detected
Acenaphthene	2.0	Not Detected
Acenaphthylene	2.0	Not Detected
Fluorene	2.0	Not Detected
Phenanthrene	2.0	Not Detected
Anthracene	2.0	Not Detected
Fluoranthene	2.0	Not Detected
Pyrene	2.0	Not Detected
Chrysene	2.0	Not Detected
Benzo(a)anthracene	2.0	Not Detected
Benzo(b)fluoranthene	2.0	Not Detected
Benzo(k)fluoranthene	2.0	Not Detected
Benzo(a)pyrene	2.0	Not Detected
Indeno(1,2,3-c,d)pyrene	2.0	Not Detected
Dibenz(a,h)anthracene	2.0	Not Detected
Benzo(g,h,i)perylene	2.0	Not Detected

Container Type: NIOSH Tubes XAD-2 w/Filter

Surrogates	%Recovery	Method Limits
2-Fluorobiphenyl	88	50-150
Terphenyl-d14	93	50-150

AIR TOXICS LTD.

SAMPLE NAME: 5515-2

ID#: 0309224-02AB

MODIFIED NIOSH METHOD 5515 GC/MS

File Name:	[illegible]	Date of Collection:	9/10/03
Dil. Factor:	2.00	Date of Analysis:	9/25/03 12:01 PM
		Date of Extraction:	9/24/03

Compound	Rpt. Limit (ug)	Amount (ug)
Naphthalene	2.0	Not Detected
2-Methylnaphthalene	2.0	Not Detected
2-Chloronaphthalene	2.0	Not Detected
Acenaphthene	2.0	Not Detected
Acenaphthylene	2.0	Not Detected
Fluorene	2.0	Not Detected
Phenanthrene	2.0	Not Detected
Anthracene	2.0	Not Detected
Fluoranthene	2.0	Not Detected
Pyrene	2.0	Not Detected
Chrysene	2.0	Not Detected
Benzo(a)anthracene	2.0	Not Detected
Benzo(b)fluoranthene	2.0	Not Detected
Benzo(k)fluoranthene	2.0	Not Detected
Benzo(a)pyrene	2.0	Not Detected
Indeno(1,2,3-c,d)pyrene	2.0	Not Detected
Dibenz(a,h)anthracene	2.0	Not Detected
Benzo(g,h,i)perylene	2.0	Not Detected

Container Type: NIOSH Tubes XAD-2 w/Filter

Surrogates	%Recovery	Method Limits
2-Fluorobiphenyl	98	50-150
Terphenyl-d14	101	50-150

AIR TOXICS LTD.

SAMPLE NAME: 5515-FB

ID#: 0309224-03AB

MODIFIED NIOSH METHOD 5515 GC/MS

[illegible]	Date of Collection: 9/10/03
[illegible]	Date of Analysis: 9/25/03 12:32 PM
[illegible]	Date of Extraction: 9/24/03

Compound	Rpt. Limit (ug)	Amount (ug)
Naphthalene	2.0	Not Detected
2-Methylnaphthalene	2.0	Not Detected
2-Chloronaphthalene	2.0	Not Detected
Acenaphthene	2.0	Not Detected
Acenaphthylene	2.0	Not Detected
Fluorene	2.0	Not Detected
Phenanthrene	2.0	Not Detected
Anthracene	2.0	Not Detected
Fluoranthene	2.0	Not Detected
Pyrene	2.0	Not Detected
Chrysene	2.0	Not Detected
Benzo(a)anthracene	2.0	Not Detected
Benzo(b)fluoranthene	2.0	Not Detected
Benzo(k)fluoranthene	2.0	Not Detected
Benzo(a)pyrene	2.0	Not Detected
Indeno(1,2,3-c,d)pyrene	2.0	Not Detected
Dibenz(a,h)anthracene	2.0	Not Detected
Benzo(g,h,i)perylene	2.0	Not Detected

Container Type: NIOSH Tubes XAD-2 w/Filter

Surrogates	%Recovery	Method Limits
2-Fluorobiphenyl	101	50-150
Terphenyl-d14	102	50-150

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SAMPLE NAME: 5515-RB

ID#: 0309224-04AB

MODIFIED NIOSH METHOD 5515 GC/MS

File Name:	c092509	Date of Collection:	9/10/03
Dil. Factor:	2.00	Date of Analysis:	9/25/03 01:04 PM
		Date of Extraction:	9/24/03

Compound	Rpt. Limit (ug)	Amount (ug)
Naphthalene	2.0	Not Detected
2-Methylnaphthalene	2.0	Not Detected
2-Chloronaphthalene	2.0	Not Detected
Acenaphthene	2.0	Not Detected
Acenaphthylene	2.0	Not Detected
Fluorene	2.0	Not Detected
Phenanthrene	2.0	Not Detected
Anthracene	2.0	Not Detected
Fluoranthene	2.0	Not Detected
Pyrene	2.0	Not Detected
Chrysene	2.0	Not Detected
Benzo(a)anthracene	2.0	Not Detected
Benzo(b)fluoranthene	2.0	Not Detected
Benzo(k)fluoranthene	2.0	Not Detected
Benzo(a)pyrene	2.0	Not Detected
Indeno(1,2,3-c,d)pyrene	2.0	Not Detected
Dibenz(a,h)anthracene	2.0	Not Detected
Benzo(g,h,i)perylene	2.0	Not Detected

Container Type: NIOSH Tubes XAD-2 w/Filter

Surrogates	%Recovery	Method Limits
2-Fluorobiphenyl	94	50-150
Terphenyl-d14	96	50-150

AIR TOXICS LTD.

SAMPLE NAME: Lab Blank

ID#: 0309224-05A

MODIFIED NIOSH METHOD 5515 GC/MS

File Name: [illegible]	Date of Collection: NA
Dil. Factor: [illegible]	Date of Analysis: 9/25/03 10:26 AM
[illegible]	Date of Extraction: 9/24/03

Compound	Rpt. Limit (ug)	Amount (ug)
Naphthalene	2.0	Not Detected
2-Methylnaphthalene	2.0	Not Detected
2-Chloronaphthalene	2.0	Not Detected
Acenaphthene	2.0	Not Detected
Acenaphthylene	2.0	Not Detected
Fluorene	2.0	Not Detected
Phenanthrene	2.0	Not Detected
Anthracene	2.0	Not Detected
Fluoranthene	2.0	Not Detected
Pyrene	2.0	Not Detected
Chrysene	2.0	Not Detected
Benzo(a)anthracene	2.0	Not Detected
Benzo(b)fluoranthene	2.0	Not Detected
Benzo(k)fluoranthene	2.0	Not Detected
Benzo(a)pyrene	2.0	Not Detected
Indeno(1,2,3-c,d)pyrene	2.0	Not Detected
Dibenz(a,h)anthracene	2.0	Not Detected
Benzo(g,h,i)perylene	2.0	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
2-Fluorobiphenyl	90	50-150
Terphenyl-d14	101	50-150

AIR TOXICS LTD.

SAMPLE NAME: LCS

ID#: 0309224-06A

MODIFIED NIOSH METHOD 5515 GC/MS

File Name: [illegible]	Date of Collection: NA
Dil. Factor: [illegible]	Date of Analysis: 9/25/03 10:58 AM
[illegible]	Date of Extraction: 9/24/03

Compound	%Recovery
Naphthalene	92
2-Methylnaphthalene	Not Spiked
2-Chloronaphthalene	Not Spiked
Acenaphthene	89
Acenaphthylene	89
Fluorene	91
Phenanthrene	97
Anthracene	89
Fluoranthene	94
Pyrene	86
Chrysene	90
Benzo(a)anthracene	83
Benzo(b)fluoranthene	83
Benzo(k)fluoranthene	89
Benzo(a)pyrene	84
Indeno(1,2,3-c,d)pyrene	76
Dibenz(a,h)anthracene	82
Benzo(g,h,i)perylene	87

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
2-Fluorobiphenyl	94	50-150
Terphenyl-d14	97	50-150

EQ Environmental Quality Management, Inc.

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

0309224 :
Reference Document No. A- 3108
Page 1 of 1

-BG Generator Testing
Project Name: Scott AFB
Project Number: 030174.0006.002
Project Manager: Tom Gerstle
Sample Team Leader: Ron Kolde

Lab Destination: Air Toxics
Lab Contact/Phone: Dale Dodge 916-985-1000
Lab Purchase Order No.: 6169
Carrier/Waybill No.:

Report to: Tom Gerstle, EQ
1800 Carillon Blvd
Cincinnati OH 45240
800-229-9475
Bill to: Same

ONE CONTAINER PER LINE

	Sample Number	Sample Description/Type	Date/Time Collected	Container Type	Sample Volume	Pre-servative	Requested Analytical Method/(Parameters)	Condition on Receipt (Lab)
01A	5515-1	Filter, 2-XAD tubes	9/8-9/10/03	Glass	N/A	Ice	NIOSH Method	
02A	5515-2	" "	9/10/03	↓	↓	↓	5515 for PAHs	
03A	5515-FB	" "	9/10/03					
04A	5515-RB	" "	9/10/03					

Special Instructions: Analyze tube A in total separate from tube B (also analyze in total) for Treat Tube A as Front section, tube B as back section

Possible Hazard Identification: Non-hazard ☒ Flammable ☐ Skin Irritant ☐ Other ____

Sample Disposal: Return to Client ☐ Disposal by Lab ☒ Archive 6 (mos.)

Turnaround Time Required: Normal ☒ Rush ☐ Results Required by ____

QA Requirements: As per NIOSH Method 5515

1. Relinquished by (Signature/Affiliation) Ron Kolde [signature]	Date: 9/11/03 Time:	1. Received by (Signature/Affiliation)	Date: Time:
2. Relinquished by (Signature/Affiliation)	Date: Time:	2. Received by (Signature/Affiliation) Laura R. Thomas AT	Date: 9/12/03 Time: 930

Comments:

CUSTODY SEAL INTACT? Y N NONE TEMP 14.4°C

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This electronic report includes the following:

- Work order Summary;
- Laboratory Narrative;
- Results; and
- Chain of Custody (copy).

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E-mail to:samplereceiving@airtoxics.com

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AN ENVIRONMENTAL ANALYTICAL LABORATORY

WORK ORDER #: 0309221

Work Order Summary

CLIENT:	Mr. Tom Gerstle Environmental Quality Management, Inc. 1800 Carillon Boulevard Cincinnati, OH 45240	**BILL TO:**	Mr. Tom Gerstle Environmental Quality Management, Inc 1800 Carillon Boulevard Cincinnati, OH 45240
PHONE:	800-229-7495 x 251	**P.O. #**	6169
FAX:	513-825-7495	**PROJECT #**	030174.0006.002 Scott AFB
DATE RECEIVED:	9/12/03	**CONTACT:**	DeDe Dodge
DATE COMPLETED:	9/25/03		

FRACTION #	NAME	TEST
01A	0011-1	Modified Method 0011
02A	0011-2	Modified Method 0011
03A	0011-FB	Modified Method 0011
04A	0011-RB	Modified Method 0011
05A	MeCl2 Blank	Modified Method 0011
06A	Type 1 H2O Blank	Modified Method 0011
07A	Trip Blank 9/4/03	Modified Method 0011
08A	Trip Spike 9/4/03	Modified Method 0011
09A	Trip Blank 9/9/03	Modified Method 0011
10A	Trip Spike 9/9/03	Modified Method 0011
11A	Lab Blank	Modified Method 0011
12A	LCS	Modified Method 0011

CERTIFIED BY: Linda L. Freeman DATE: 09/25/03

Laboratory Director

Certfication numbers: AR DEQ, CA NELAP - 02110CA, LA NELAP/LELAP- AI 30763, NJ NELAP - CA004
NY NELAP - 11291, UT NELAP - 9166389892
Name of Accrediting Agency: NELAP/Florida Department of Health, Scope of Application: Clean Air Act,
Accreditation number: E87680, Effective date: 07/01/03, Expiration date: 06/30/04
Air Toxics Ltd. certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
Modified Method 0011
Environmental Quality Management, Inc.
Workorder# 0309221

Six Jar and four DNPH Screw Cap Vial samples were received on September 12, 2003. The laboratory performed the analysis via Modified EPA SW-846 Method 0011/8315 using High Pressure Liquid Chromatography (HPLC) with an Ultraviolet (UV) Detector. See the data sheets for the reporting limits for each compound.

Requirement	*Method 0011/8315A*	*ATL Modifications*
Reagent Cleaning	Cleaning utilizes DCM with a final cleaning using cyclohexane.	70:30 Hexane: DCM used for all cleanings.
Extraction	Serially extracted two to three times with DCM Concentrate using Kuderna-Danish (K-D).	Extracted one time with 70:30 Hexane: DCM (a DCM only extraction solvent may be used if client requests). Concentrate using Nitrogen evaporator (turbo-vap). Single extraction is sufficient and minimizes further addition of background contamination.
Extraction Conditions	Use buffer to adjust pH of sample prior to extraction.	Adjustment of pH not performed.

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

The trip blanks, 9/4/03 and 9/9/03, have reportable levels of formaldehyde present.

Samples 0011-1 and 0011-2 appeared colorless which indicated that the reagent derivitization capacity may have been exceeded. To insure complete derivatization of carbonyls in the samples, an aliquot of 2,4-DNPH was added to the samples prior to extraction.

Extraction solvent was not added to samples 0011-RB, Trip Spike 9/4/03, and Trip Spike 9/9/03 at the time of collection which may have caused a breakdown of Acrolein in the acidic DNPH reagent.

The extraction solvent was added to sample 0011-FB in the field, therefore the date of extraction is also the date of collection.

Definition of Data Qualifying Flags

Seven qualifiers may have been used on the data analysis sheets and indicate as follows:
B- Compound present in laboratory blank greater than reporting limit.
J - Estimated value.
E - Exceeds instrument calibration range.
S - Saturated peak.
Q - Exceeds quality control limits.
U - Compound analyzed for but not detected above the detection limit.

M - Reported value may be biased due to apparent matrix interferences.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified
b-File was quantified by a second column and detector
r1-File was requantified for the purpose of reissue

AIR TOXICS LTD.

SAMPLE NAME: 0011-1

ID#: 0309221-01A

MODIFIED EPA SW-846 METHOD 0011/8315A HPLC

File Name: a092407	Date of Collection: 9/8/03
Dil. Factor: [illegible]	Date of Analysis: 9/24/03 01:22 PM
	Date of Extraction: 9/15/03

Compound	Rpt. Limit (ug)	Amount (ug)
Formaldehyde	26	800
Acetaldehyde	26	750
Acrolein	26	Not Detected
Propanal	26	Not Detected
Crotonaldehyde	26	90 M
Methyl Ethyl Ketone/Butyraldehydes	26	Not Detected
Benzaldehyde	26	Not Detected
Isopentanal	26	Not Detected
Pentanal	26	Not Detected
o-Tolualdehyde	26	Not Detected
m,p-Tolualdehyde	26	Not Detected
Hexanal	26	Not Detected

M = Reported value may be biased due to apparent matrix interferences
Total Volume = 570 mL

Container Type: Jar

AIR TOXICS LTD.

SAMPLE NAME: 0011-2

ID#: 0309221-02A

MODIFIED EPA SW-846 METHOD 0011/8315A HPLC

File Name: [illegible]	Date of Collection: 9/10/03
[illegible]	Date of Analysis: 9/16/03 07:57 AM
[illegible]	Date of Extraction: 9/15/03

Compound	Rpt. Limit (ug)	Amount (ug)
Formaldehyde	110	3800
Acetaldehyde	110	1200
Acrolein	110	560
Propanal	110	240
Crotonaldehyde	110	260
Methyl Ethyl Ketone/Butyraldehydes	110	260
Benzaldehyde	110	220 M
Isopentanal	110	Not Detected
Pentanal	110	Not Detected
o-Tolualdehyde	110	Not Detected
m,p-Tolualdehyde	110	Not Detected
Hexanal	110	Not Detected

M = Reported value may be biased due to apparent matrix interferences

Total Volume = 630 mL

Container Type: Jar

AIR TOXICS LTD.

SAMPLE NAME: 0011-FB

ID#: 0309221-03A

MODIFIED EPA SW-846 METHOD 0011/8315A HPLC

File Name:	e091501[illegible]	Date of Collection:	9/10/03
Dil. Factor:	5.00	Date of Analysis:	9/15/03 02:01 PM
		Date of Extraction:	9/10/03

Compound	Rpt. Limit (ug)	Amount (ug)
Formaldehyde	2.5	22
Acetaldehyde	2.5	18
Acrolein	2.5	Not Detected
Propanal	2.5	13
Crotonaldehyde	2.5	Not Detected
Methyl Ethyl Ketone/Butyraldehydes	2.5	Not Detected
Benzaldehyde	2.5	Not Detected
Isopentanal	2.5	17
Pentanal	2.5	Not Detected
o-Tolualdehyde	2.5	Not Detected
m,p-Tolualdehyde	2.5	Not Detected
Hexanal	2.5	13

Total Volume = 480 mL

Container Type: Jar

AIR TOXICS LTD.

SAMPLE NAME: 0011-RB

ID#: 0309221-04A

MODIFIED EPA SW-846 METHOD 0011/8315A HPLC

File Name: [illegible]	Date of Collection: 9/10/03
Dil. Factor: [illegible]	Date of Analysis: [illegible] PM
[illegible]	Date of Extraction: 9/16/03

Compound	Rpt. Limit (ug)	Amount (ug)
Formaldehyde	2.9	17
Acetaldehyde	2.9	3.5
Acrolein	2.9	Not Detected
Propanal	2.9	4.7
Crotonaldehyde	2.9	Not Detected
Methyl Ethyl Ketone/Butyraldehydes	2.9	Not Detected
Benzaldehyde	2.9	Not Detected
Isopentanal	2.9	6.4
Pentanal	2.9	Not Detected
o-Tolualdehyde	2.9	Not Detected
m,p-Tolualdehyde	2.9	Not Detected
Hexanal	2.9	7.6

Total Volume = 520 mL

Container Type: Jar

AIR TOXICS LTD.

SAMPLE NAME: MeCl2 Blank

ID#: 0309221-05A

MODIFIED EPA SW-846 METHOD 0011/8315A HPLC

File Name:	[illegible]	Date of Collection: 9/10/03
Dil. Factor:	[illegible]	Date of Analysis: 9/15/03 01:17 PM
[illegible]		Date of Extraction: 9/15/03

Compound	Rpt. Limit (ug)	Amount (ug)
Formaldehyde	1.9	Not Detected
Acetaldehyde	1.9	10
Acrolein	1.9	Not Detected
Propanal	1.9	Not Detected
Crotonaldehyde	1.9	Not Detected
Methyl Ethyl Ketone/Butyraldehydes	1.9	Not Detected
Benzaldehyde	1.9	Not Detected
Isopentanal	1.9	Not Detected
Pentanal	1.9	Not Detected
o-Tolualdehyde	1.9	Not Detected
m,p-Tolualdehyde	1.9	Not Detected
Hexanal	1.9	Not Detected

Total Volume = 100 mL

Container Type: Jar

AIR TOXICS LTD.

SAMPLE NAME: Type 1 H2O Blank

ID#: 0309221-06A

MODIFIED EPA SW-846 METHOD 0011/8315A HPLC

[illegible] Date of Collection: 9/10/03
[illegible] Date of Analysis: 9/15/03 12:56 PM
[illegible] Date of Extraction: 9/15/03

Compound	Rpt. Limit (ug)	Amount (ug)
Formaldehyde	0 50	Not Detected
Acetaldehyde	0 50	0.55
Acrolein	0.50	Not Detected
Propanal	0.50	Not Detected
Crotonaldehyde	0.50	Not Detected
Methyl Ethyl Ketone/Butyraldehydes	0 50	Not Detected
Benzaldehyde	0 50	Not Detected
Isopentanal	0.50	Not Detected
Pentanal	0.50	Not Detected
o-Tolualdehyde	0.50	Not Detected
m,p-Tolualdehyde	0 50	Not Detected
Hexanal	0 50	Not Detected

Total Volume = 215 mL

Container Type: Jar

AIR TOXICS LTD.

SAMPLE NAME: Trip Blank 9/4/03

ID#: 0309221-07A

MODIFIED EPA SW-846 METHOD 0011/8315A HPLC

File Name:	e0915009	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 9/15/03 10:41 AM
		Date of Extraction: 9/15/03

Compound	Rpt. Limit (ug)	Amount (ug)
Formaldehyde	0 50	0 69
Acetaldehyde	0 50	Not Detected
Acrolein	0.50	Not Detected
Propanal	0.50	Not Detected
Crotonaldehyde	0.50	Not Detected
Methyl Ethyl Ketone/Butyraldehydes	0 50	Not Detected
Benzaldehyde	0 50	Not Detected
Isopentanal	0.50	Not Detected
Pentanal	0 50	Not Detected
o-Tolualdehyde	0.50	Not Detected
m,p-Tolualdehyde	0 50	Not Detected
Hexanal	0 50	Not Detected

Total Volume = 10.0 mL

Container Type: DNPH Screw Cap Vial

AIR TOXICS LTD.

SAMPLE NAME: Trip Spike 9/4/03

ID#: 0309221-08A

MODIFIED EPA SW-846 METHOD 0011/8315A HPLC

Date of Collection: NA
Date of Analysis: 9/15/03 11:22 AM
Date of Extraction: 9/15/03

Compound	%Recovery
Formaldehyde	97
Acetaldehyde	102
Acrolein	70 Q
Propanal	121
Crotonaldehyde	Not Spiked
Methyl Ethyl Ketone/Butyraldehydes	109
Benzaldehyde	Not Spiked
Isopentanal	Not Spiked
Pentanal	111
o-Tolualdehyde	Not Spiked
m,p-Tolualdehyde	Not Spiked
Hexanal	90

Q = Exceeds Quality Control limits
Total Volume = 11.0 mL
Container Type: DNPH Screw Cap Vial

AIR TOXICS LTD.

SAMPLE NAME: Trip Blank 9/9/03

ID#: 0309221-09A

MODIFIED EPA SW-846 METHOD 0011/8315A HPLC

File Name:	[illegible]	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 9/15/03 11:02 AM
		Date of Extraction: 9/15/03

Compound	Rpt. Limit (ug)	Amount (ug)
Formaldehyde	0.50	0.58
Acetaldehyde	0.50	Not Detected
Acrolein	0.50	Not Detected
Propanal	0 50	Not Detected
Crotonaldehyde	0.50	Not Detected
Methyl Ethyl Ketone/Butyraldehydes	0 50	Not Detected
Benzaldehyde	0.50	Not Detected
Isopentanal	0 50	Not Detected
Pentanal	0 50	Not Detected
o-Tolualdehyde	0.50	Not Detected
m,p-Tolualdehyde	0.50	Not Detected
Hexanal	0.50	Not Detected

Total Volume = 10.0 mL

Container Type: DNPH Screw Cap Vial

AIR TOXICS LTD.

SAMPLE NAME: Trip Spike 9/9/03

ID#: 0309221-10A

MODIFIED EPA SW-846 METHOD 0011/8315A HPLC

File Name: [illegible]	Date of Collection: NA
Dil. Factor: [illegible]	Date of Analysis: 9/15/03 11:43 AM
[illegible]	Date of Extraction: 9/15/03

Compound	%Recovery
Formaldehyde	101
Acetaldehyde	99
Acrolein	<0.50 Q
Propanal	124
Crotonaldehyde	Not Spiked
Methyl Ethyl Ketone/Butyraldehydes	107
Benzaldehyde	Not Spiked
Isopentanal	Not Spiked
Pentanal	107
o-Tolualdehyde	Not Spiked
m,p-Tolualdehyde	Not Spiked
Hexanal	88

Q = Exceeds Quality Control limits

Total Volume = 11 0 mL

Container Type: DNPH Screw Cap Vial

AIR TOXICS LTD.

SAMPLE NAME: Lab Blank

ID#: 0309221-11A

MODIFIED EPA SW-846 METHOD 0011/8315A HPLC

File Name: e091503	Date of Collection: NA
Dil. Factor: 1.00	Date of Analysis: 9/15/03 07:22 AM
	Date of Extraction: 9/15/03

Compound	Rpt. Limit (ug)	Amount (ug)
Formaldehyde	0.50	Not Detected
Acetaldehyde	0.50	Not Detected
Acrolein	0.50	Not Detected
Propanal	0 50	Not Detected
Crotonaldehyde	0.50	Not Detected
Methyl Ethyl Ketone/Butyraldehydes	0 50	Not Detected
Benzaldehyde	0.50	Not Detected
Isopentanal	0 50	Not Detected
Pentanal	0 50	Not Detected
o-Tolualdehyde	0.50	Not Detected
m,p-Tolualdehyde	0.50	Not Detected
Hexanal	0.50	Not Detected

Total Volume = 100 mL

Container Type: NA - Not Applicable

TELEPHONE 773-772-3577
FAX NO 773-772-3778

Phoenix Chemical Laboratory, Inc.

FUEL AND LUBRICANT TECHNOLOGISTS
3953 SHAKESPEARE AVENUE
CHICAGO, ILL. 60647-3497

September 29, 2003

RECEIVED FROM Environmental Quality Management, Inc.
1800 Carillon Blvd.
Cincinnati, OH 45240
Attn: Tina Dunmoyer

SAMPLE OF Biodiesel

LABORATORY NO 03 9 16 25

MARKED 030174,0006,002
09/10/03

Sulfur, %	0.026
Carbon, %	84.89
Hydrogen, %	12.96
Nitrogen, ppm	51
Ash, %	0.002
Oxygen, % by difference	2.12
Heat of Combustion, BTU/Lb	
Gross	19035
Net	17853
Hydrocarbon Types, %	
Oxygenates, as methylsoyate	18.6
Saturated Hydrocarbons	
Paraffins	26.6
Naphthenes	17.7
Olefins (Note 1)	trace
Aromatics	37.1

Note 1: Olefinic hydrocarbons not including unsaturation associated with methylsoyate.

Arthur A. Krawetz

PHOENIX CHEMICAL LABORATORY, INC. FOUNDED 1927 REG

EQ **Environmental Quality Management, Inc.**

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

Reference Document No. A- 3110
Page 1 of 1

Project Name: 86 GENERATOR TESTING
Project Number: 030174.0006.002
Project Manager: TOM GERSTLE
Sample Team Leader: TOM GERSTLE

Lab Destination: PHOENIX CHEMICAL
Lab Contact/Phone: 773-772-3577
Lab Purchase Order No. 6268
Carrier/Waybill No. 840198688263

Report to: TOM GERSTLE
ENVIRONMENTAL QUALITY
1800 CARILLON BLVD
CINTI, OH 45240

Bill to: STEVE SCHLICKMAN
1800 CARILLON BLVD
CINTI, OH 45240

ONE CONTAINER PER LINE

Sample Number	Sample Description/Type	Date/Time Collected	Container Type	Sample Volume	Pre-servative	Requested Analytical Method/(Parameters)	Condition on Receipt (Lab)
BIODIESEL	BIODIESEL	09/10/03	500ml	1000 ml(*)		PONA (PARAFFINS,	
			GLASS			OLEFINS, NAPHTHENES	
						AROMATICS) % CARBON	
						% SULFUR, % HYDROGEN	
						% NITROGEN, % ASH,	

Special Instructions: SAMPLE HAS BEEN SPLIT FOR SHIPPING PURPOSES ONLY   Btu/lb

Possible Hazard Identification:
Non-hazard ☐ Flammable ☒ Skin Irritant ☒ Other ________

Sample Disposal:
Return to Client ☐ Disposal by Lab ☐ Archive ________ (mos.)

Turnaround Time Required:
Normal ☒ Rush ☐ Results Required by ________

QA Requirements:

1. Relinquished by (Signature/Affiliation) [signature]	Date: 09/15/03 Time: 1600	1. Received by (Signature/Affiliation)	Date: Time:
2. Relinquished by (Signature/Affiliation)	Date: Time:	2. Received by (Signature/Affiliation)	Date: Time:

Comments:

APPENDIX D

QUALITY ASSURANCE/QUALITY CONTROL

HORSE POWER CALCULATIONS

-86 Horsepower Calculation

Example Calculation: Scott AFB, 10% load

[208 volts x 25 amps x 3^0 5 x 0 9/1000] kw x 1 341 kw/hp = 10 87 hp

Unit/Load	Run No.	Fuel Usage lbs/hr	AMPS	kilowatts	Calculated horsepower
DG09					
10%	1	26 00	25	8 11	10 87
	2	26.80	25	8.11	10.87
	3	28 29	25	8 11	10.87
Average		27 03	25		10 87
25%	1	32 02	100	32.42	43.48
	2	32.40	100	32.42	43.48
	3	32 54	100	32.42	43.48
Average		32 32	100		43 48
50%	1	37 83	130	42 15	56.52
	2	37.30	130	42.15	56.52
	3	36 61	130	42 15	56.52
Average		37.25	130	42.15	56.52
75%	1	46 96	190	61.61	82.61
	2	47 64	190	61 61	82.61
	3	47.23	190	61.61	82.61
Average		47 28	190	61 61	82.61
100%	1	44 05	210	68 09	91 31
	2	41.08	210	68.09	91.31
	3	43 03	210	68 09	91 31
Average		42 72	210	68.09	91.31
FL08					
100%	1	2.03	20	6.48	8.70
	2	2 03	20	6 48	8 70
	3	2 03	20	6.48	8.70
Average		2.03	20	6 48	8 70

CEM – GASEOUS POLLUTANTS
(CO, CO_2, O_2, THC, NO_X) –
-86 Generator

Date:	Run:	10-1				Horsepower:	10.9	
9/8/2003	**Flow (dscfm):**	359				**Fuel Usage (gal/hr):**	3.5	
	Moisture (%):	3.7						
	Pollutant:	**NOx**	**CO**	**NMHC**	**THC**	**Methane**	**CO2**	**O2**
	Concentration (ppm or %)	1337 00	36 80	59 24	63.14	3 90	4 2	16.2
	Mass Rate (lb/hr)	3.44	0.06	0 05	5 61E-02	3 49E-03	--	--
	Mass Rate (lb/gal fuel)	0.98	0 02	0 02	0.02	0.00	--	--
	Mass Rate (gr/hp*hr)	143.63	2.41	2.20	2.34	0.15	--	--

Date:	Run:	10-2				Horsepower:	10.9	
9/8/2003	**Flow (dscfm):**	353				**Fuel Usage (gal/hr):**	3 6	
	Moisture (%):	4						
	Pollutant:	**NOx**	**CO**	**NMHC**	**THC**	**Methane**	**CO2**	**O2**
	Concentration (ppm or %)	1315.00	36.40	42.55	46 15	3 60	4.2	16 1
	Mass Rate (lb/hr)	3 33	0.06	0 04	4.03E-02	3 17E-03	--	--
	Mass Rate (lb/gal fuel)	0.92	0.02	0.01	0 01	0 00	--	--
	Mass Rate (gr/hp*hr)	138.91	2.34	1.55	1.68	0.13	--	--

Date:	Run:	10-3				Horsepower:	10.9	
9/8/2003	**Flow (dscfm):**	352				**Fuel Usage (gal/hr):**	3 8	
	Moisture (%):	3.8						
	Pollutant:	**NOx**	**CO**	**NMHC**	**THC**	**Methane**	**CO2**	**O2**
	Concentration (ppm or %)	1300.00	36.10	41 09	44.59	3.50	4 1	16 1
	Mass Rate (lb/hr)	3.28	0.06	0.04	3 89E-02	3 07E-03	--	--
	Mass Rate (lb/gal fuel)	0 86	0 01	0 01	0.01	0.00	--	--
	Mass Rate (gr/hp*hr)	136.93	2.31	1.49	1.62	0.13	--	--

Date:	Run:	25-1				Horsepower:	43 5	
9/9/2003	Flow (dscfm):	352				Fuel Usage (gal/hr):	4 3	
	Moisture (%):	4.6						
	Pollutant:	NOx	CO	NMHC	THC	Methane	CO2	O2
	Concentration (ppm or %)	1411.00	37 70	47 19	49 69	3.20	4.3	15 9
	Mass Rate (lb/hr)	3 56	0.06	0 04	4 33E-02	2.81E-03	--	--
	Mass Rate (lb/gal fuel)	0.82	0 01	0 01	0.01	0 00	--	--
	Mass Rate (gr/hp*hr)	37.16	0.60	0.42	0.45	0.03	--	--

Date:	Run:	25-2				Horsepower:	43 5	
9/9/2003	Flow (dscfm):	354				Fuel Usage (gal/hr):	4 4	
	Moisture (%):	4.7						
	Pollutant:	NOx	CO	NMHC	THC	Methane	CO2	O2
	Concentration (ppm or %)	1494 00	39 00	43.62	45 10	3.00	4 4	15.6
	Mass Rate (lb/hr)	3.79	0 06	0 04	3.95E-02	2.65E-03	--	--
	Mass Rate (lb/gal fuel)	0 87	0.01	0.01	0 01	0 00	--	--
	Mass Rate (gr/hp*hr)	39.57	0.63	0.39	0.41	0.03	--	--

Date:	Run:	25-3				Horsepower:	43.5	
9/9/2003	Flow (dscfm):	353				Fuel Usage (gal/hr):	4 4	
	Moisture (%):	5.2						
	Pollutant:	NOx	CO	NMHC	THC	Methane	CO2	O2
	Concentration (ppm or %)	195.30	98 30	41.28	79.10	1 10	4.1	15 2
	Mass Rate (lb/hr)	0 49	0 15	0.07	6 91E-02	9 67E-04	--	--
	Mass Rate (lb/gal fuel)	0.11	0.03	0 02	0.02	0 00	--	--
	Mass Rate (gr/hp*hr)	5.16	1.58	0.71	0.72	0.01	--	--

Date:	Run:	50-1			Horsepower:		56 5	
9/9/2003	**Flow (dscfm):**	351			**Fuel Usage (gal/hr):**		5.1	
	Moisture (%):	5.1						
	Pollutant:	**NOx**	**CO**	**NMHC**	**THC**	**Methane**	**CO2**	**O2**
	Concentration (ppm or %)	1730 00	43.40	51.60	52 00	0.40	4 9	14 7
	Mass Rate (lb/hr)	4 35	0 07	0 04	4.52E-02	3.50E-04	--	--
	Mass Rate (lb/gal fuel)	0.85	0.01	0.01	0 01	0 00	--	--
	Mass Rate (gr/hp*hr)	34.94	0.53	0.36	0.36	0.00	--	--

Date:	Run:	50-2			Horsepower:		56 5	
9/9/2003	**Flow (dscfm):**	354			**Fuel Usage (gal/hr):**		5.0	
	Moisture (%):	4.3						
	Pollutant:	**NOx**	**CO**	**NMHC**	**THC**	**Methane**	**CO2**	**O2**
	Concentration (ppm or %)	1752 00	43 00	48.29	48.69	0 40	4 9	14 6
	Mass Rate (lb/hr)	4 44	0.07	0.04	4 27E-02	3 53E-04	--	--
	Mass Rate (lb/gal fuel)	0 88	0 01	0 01	0.01	0.00	--	--
	Mass Rate (gr/hp*hr)	35.69	0.53	0.34	0.34	0.00	--	--

Date:	Run:	50-3			Horsepower:		56 5	
9/9/2003	**Flow (dscfm):**	352			**Fuel Usage (gal/hr):**		4.9	
	Moisture (%):	4.7						
	Pollutant:	**NOx**	**CO**	**NMHC**	**THC**	**Methane**	**CO2**	**O2**
	Concentration (ppm or %)	1741 00	42.40	43.87	44 07	0 20	4 8	14 7
	Mass Rate (lb/hr)	4 39	0 07	0 04	3 84E-02	1 75E-04	--	--
	Mass Rate (lb/gal fuel)	0.89	0.01	0.01	0.01	0 00	--	--
	Mass Rate (gr/hp*hr)	35.27	0.52	0.31	0.31	0.00	--	--

Date:	Run:	75-1				Horsepower:	82 6	
9/9/2003	Flow (dscfm):	347				Fuel Usage (gal/hr):	6.3	
	Moisture (%):	6.4						
	Pollutant:	NOx	CO	NMHC	THC	Methane	CO2	O2
	Concentration (ppm or %)	2310.00	81.10	42.05	55.02	0 10	6 2	12.8
	Mass Rate (lb/hr)	5 74	0.12	0.05	4 73E-02	8 65E-05	--	--
	Mass Rate (lb/gal fuel)	0.91	0.02	0 01	0.01	0 00	--	--
	Mass Rate (gr/hp*hr)	31.56	0.67	0.26	0.26	0.00	--	--

Date:	Run:	75-2				Horsepower:	82.6	
9/9/2003	Flow (dscfm):	343				Fuel Usage (gal/hr):	6 4	
	Moisture (%):	6.5						
	Pollutant:	NOx	CO	NMHC	THC	Methane	CO2	O2
	Concentration (ppm or %)	2308 00	76 20	38.39	40.00	0 00	6.2	12 8
	Mass Rate (lb/hr)	5.67	0.11	0 03	3.40E-02	0.00E+00	--	--
	Mass Rate (lb/gal fuel)	0 88	0 02	0.01	0.01	0 00	--	--
	Mass Rate (gr/hp*hr)	31.17	0.63	0.19	0.19	0.00	--	--

Date:	Run:	75-3				Horsepower:	82 6	
9/9/2003	Flow (dscfm):	343				Fuel Usage (gal/hr):	6.4	
	Moisture (%):	6.3						
	Pollutant:	NOx	CO	NMHC	THC	Methane	CO2	O2
	Concentration (ppm or %)	2224 00	73.10	37.53	40 77	0.00	6 1	12.9
	Mass Rate (lb/hr)	5.47	0.11	0.03	3.46E-02	0 00E+00	--	--
	Mass Rate (lb/gal fuel)	0.86	0.02	0 01	0.01	0 00	--	--
	Mass Rate (gr/hp*hr)	30.04	0.60	0.19	0.19	0.00	--	--

Date:	Run:	100-1			Horsepower:		91.3	
9/10/2003	**Flow (dscfm):**	349			**Fuel Usage (gal/hr):**		5.9	
	Moisture (%):	5.6						
	Pollutant:	**NOx**	**CO**	**NMHC**	**THC**	**Methane**	**CO2**	**O2**
	Concentration (ppm or %)	2041 00	42 90	38 67	38.67	0.00	5 4	13 7
	Mass Rate (lb/hr)	5 10	0.07	0 03	3 34E-02	0 00E+00	--	--
	Mass Rate (lb/gal fuel)	0 86	0 01	0 01	0.01	0.00	--	--
	Mass Rate (gr/hp*hr)	25.38	0.32	0.17	0.17	0.00	--	--

Date:	Run:	100-2			Horsepower:		91 3	
9/10/2003	**Flow (dscfm):**	342			**Fuel Usage (gal/hr):**		5 5	
	Moisture (%):	5.7						
	Pollutant:	**NOx**	**CO**	**NMHC**	**THC**	**Methane**	**CO2**	**O2**
	Concentration (ppm or %)	2000.00	45.50	43 52	43 52	0 00	5.6	13 3
	Mass Rate (lb/hr)	4 90	0 07	0.04	3.69E-02	0 00E+00	--	--
	Mass Rate (lb/gal fuel)	0.88	0 01	0 01	0 01	0 00	--	--
	Mass Rate (gr/hp*hr)	24.37	0.34	0.18	0.18	0.00	--	--

Date:	Run:	100-3			Horsepower:		91 3	
9/10/2003	**Flow (dscfm):**	333			**Fuel Usage (gal/hr):**		5.8	
	Moisture (%):	5.8						
	Pollutant:	**NOx**	**CO**	**NMHC**	**THC**	**Methane**	**CO2**	**O2**
	Concentration (ppm or %)	2004 00	45 80	44 90	44.90	0 00	5 6	13.6
	Mass Rate (lb/hr)	4.78	0.07	0 04	3 70E-02	0 00E+00	--	--
	Mass Rate (lb/gal fuel)	0 82	0 01	0.01	0.01	0.00	--	--
	Mass Rate (gr/hp*hr)	23.77	0.33	0.18	0.18	0.00	--	--

CEM – GASEOUS POLLUTANTS
(CO, CO_2, O_2, THC, NO_X) -
MF2 Lighting Unit Generator

Date:	Run:	L-5-1				Horsepower:	8.7	
9/10/2003	**Flow (dscfm):**	30				**Fuel Usage (gal/hr):**	0 3	
	Moisture (%):	3.4						
	Pollutant:	**NOx**	**CO**	**NMHC**	**THC**	**Methane**	**CO2**	**O2**
	Concentration (ppm or %)	277.60	181 40	36 58	36 58	0 00	4 1	14.9
	Mass Rate (lb/hr)	0 06	0.02	0 00	2 72E-03	0.00E+00	--	--
	Mass Rate (lb/gal fuel)	0 22	0 09	0.01	0.01	0.00	--	--
	Mass Rate (gr/hp*hr)	3.12	1.24	0.14	0.14	0.00	--	--

Date:	Run:	L-5-2				Horsepower:	8.7	
9/10/2003	**Flow (dscfm):**	30				**Fuel Usage (gal/hr):**	0 3	
	Moisture (%):	5.3						
	Pollutant:	**NOx**	**CO**	**NMHC**	**THC**	**Methane**	**CO2**	**O2**
	Concentration (ppm or %)	243 00	180.90	38 01	38.01	0 00	4 1	15 1
	Mass Rate (lb/hr)	0 05	0 02	0.00	2 82E-03	0 00E+00	--	--
	Mass Rate (lb/gal fuel)	0 19	0.09	0 01	0.01	0 00	--	--
	Mass Rate (gr/hp*hr)	2.73	1.24	0.15	0.15	0.00	--	--

Date:	Run:	L-5-3				Horsepower:	8 7	
9/10/2003	**Flow (dscfm):**	30				**Fuel Usage (gal/hr):**	0.3	
	Moisture (%):	5						
	Pollutant:	**NOx**	**CO**	**NMHC**	**THC**	**Methane**	**CO2**	**O2**
	Concentration (ppm or %)	261 10	176 40	36 63	36 63	0 00	4 3	15 3
	Mass Rate (lb/hr)	0 06	0.02	0.00	2 72E-03	0.00E+00	--	--
	Mass Rate (lb/gal fuel)	0 20	0 08	0 01	0 01	0 00	--	--
	Mass Rate (gr/hp*hr)	2.93	1.20	0.14	0.14	0.00	--	--

PARTICULATE
-86 GENERATOR

Summary of Stack Gas Parameters and Test Results
Generator Testing
Scott AFB
US EPA Test Method 5 - Particulate Matter
Generator - 10% Loading
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	RUN NUMBER RUN DATE RUN TIME	10-5-1 9/8/2003 1513-1613	10-5-2 9/8/2003 1637-1737	10-5-3 9/8/2003 1752-1852	Average
	MEASURED DATA				
P_{static}	Stack Static Pressure, inches H_2O	4 60 ✓	3 50	3.50	3 87
y	Meter Box Correction Factor	1 006 ✓	1 006	1 006	1 006
P_{bar}	Barometric Pressure, inches Hg	30 65 ✓	30 65	30 65	30 65
V_m	Sample Volume, ft^3	49 829 ✓	48 547	43 733	47 370
$Dp^{1/2}$	Average Square Root Dp, (in $H_2O)^{1/2}$	1 2688 ✓	1 3693	1 4101	1.3494
DH	Avg Meter Orifice Pressure, in H_2O	2.20 ✓	2 13	1 60	1 98
T_m	Average Meter Temperature, °F	88 ✓	91	92	90
T_s	Average Stack Temperature, °F	300 ✓	449	510	420
V_{lc}	Condensate Collected, ml	40 4 ✓	42 9	36 7	40 0
CO_2	Carbon Dioxide content, % by volume	4 2 ✓	4 2	4 1	4.2
O_2	Oxygen content, % by volume	16 2 ✓	16 1	16 1	16 1
N_2	Nitrogen content, % by volume	79 6	79 7	79.8	79 7
C_p	Pitot Tube Coefficient	0 99 ✓	0.99	0 99	0.99
	Circular Stack? 1=Y,0=N·	1	1	1	
As	Diameter or Dimensions, inches:	4 00 ✓	4 00	4 00	4 00
Q	Sample Run Duration, minutes	60 ✓	60	60	60
D_n	Nozzle Diameter, inches	0 195 ✓	0 195	0 183	0 191
	CALCULATED DATA				
A_n	Nozzle Area, ft^2	0 000207	0 000207	0.000183	0.000199
$V_{m(std)}$	Standard Meter Volume, ft^3	49 718	48 211	43 297	47 075
$V_{m(std)}$	Standard Meter Volume, m^3	1 408	1 365	1 226	1 333
Q_m	Average Sampling Rate, dscfm	0.829	0.804	0.722	0.785
P_s	Stack Pressure, inches Hg	30.99	30 91	30.91	30.93
B_{ws}	Moisture, % by volume	3 7 ✓	4 0	3 8	3 8
$B_{ws(sat)}$	Moisture (at saturation), % by volume	445.6	2867.2	5139.7	2817.5
V_{wstd}	Standard Water Vapor Volume, ft^3	1 902	2 019	1 727	1 883
$1-B_{ws}$	Dry Mole Fraction	0.963	0.960	0.962	0.962
M_d	Molecular Weight (d b), lb/lb•mole	29 32	29 32	29 30	29 31
M_s	Molecular Weight (w.b), lb/lb•mole	28.90	28.86	28 87	28.88
V_s	Stack Gas Velocity, ft/s	98 9 ✓	117 0	124 4	113 4
A	Stack Area, ft^2	0.1	0.1	0.1	0.09
Q_a	Stack Gas Volumetric flow, acfm	518 ✓	613	652	594
Q_s	Stack Gas Volumetric flow, dscfm	359 ✓	353	352	355
Q_s	Stack Gas Volumetric flow, dscmm	10	10	10	10
I	Isokinetic Sampling Ratio, %	97.2	95.9	97.9	97.0

✓ RKL 10/24/03

Summary of Stack Gas Parameters and Test Results
Generator Testing
Scott AFB
US EPA Test Method 5 - Particulate Matter
Generator - 10% Loading

	RUN NUMBER	***10-5-1***	***10-5-2***	***10-5-3***	
	RUN DATE	***9/8/2003***	***9/8/2003***	***9/8/2003***	***Average***
	RUN TIME	***1513-1613***	***1637-1737***	***1752-1852***	
	EMISSIONS DATA				
	Particulate Matter				
PM	Filter Weight Gain, mg	12.2	5.9	8.45	
PM	Beaker Weight Gain, mg	11.65	11.75	13.8	
PM	Total Catch, g	0.0239	0.0177	0.0223	0.0213
C_{PM}	**Concentration, gr/dscf**	**7.40E-03**	**5.65E-03**	**7.93E-03**	**6.99E-03**
C_{PM}	**Concentration, lb/dscf**	**1.06E-06**	**8.07E-07**	**1.13E-06**	**9.99E-07**
E_{PM}	**Emission Rate, lb/hr**	**2.28E-02**	**1.71E-02**	**2.39E-02**	**2.13E-02**
	Condensible Matter				
PM	Organic Gain, mg	12 3	12.2	12 4	
PM	Aqueous Gain, mg	19.3	14	18 9	
PM	Total Catch, g	0.0316	0.0262	0 0313	0.03
C_{PM}	**Concentration, gr/dscf**	**9.81E-03**	**8.39E-03**	**1.12E-02**	**9.78E-03**
C_{PM}	**Concentration, lb/dscf**	**1.40E-06**	**1.20E-06**	**1.59E-06**	**1.40E-06**
E_{PM}	**Emission Rate, lb/hr**	**3.02E-02**	**2.53E-02**	**3.37E-02**	**2.97E-02**
	Total Particulate Matter				
PM	Total Catch, g	5.55E-02	4 39E-02	5 36E-02	0 05
C_{PM}	**Concentration, gr/dscf**	**1.72E-02**	**1.40E-02**	**1.91E-02**	**0.02**
C_{PM}	**Concentration, lb/dscf**	**2.46E-06**	**2.01E-06**	**2.73E-06**	**0.00**
E_{PM}	**Emission Rate, lb/hr**	**5.29E-02**	**4.24E-02**	**5.76E-02**	**0.05**

Summary of Stack Gas Parameters and Test Results
Generator Testing
Scott AFB
US EPA Test Method 5 - Particulate Matter
Generator - 25% Loading

	RUN NUMBER	***25-5-1***	***25-5-2***	***25-5-3***	
	RUN DATE	***9/9/2003***	***9/9/2003***	***9/9/2003***	***Average***
	RUN TIME	***0809-0909***	***0925-1025***	***1042-1142***	
	MEASURED DATA				
P_{static}	Stack Static Pressure, inches H_2O	9.00	2 50	2.50	4.67
y	Meter Box Correction Factor	1 006	1 006	1 006	1 006
P_{bar}	Barometric Pressure, inches Hg	30.69	30.69	30.69	30 69
V_m	Sample Volume, ft^3	45 611	42.175	44.423	44.070
$Dp^{1/2}$	Average Square Root Dp, (in $H_2O)^{1/2}$	1 4177	1 4403	1 4572	1 4384
DH	Avg Meter Orifice Pressure, in H_2O	1 90	1 65	1.70	1.75
T_m	Average Meter Temperature, °F	69	78	88	78
T_s	Average Stack Temperature, °F	523	523	549	532
V_{lc}	Condensate Collected, ml	48.3	44 8	51 7	48 3
CO_2	Carbon Dioxide content, % by volume	4 3	4 4	4.1	4 3
O_2	Oxygen content, % by volume	15 9	15.6	15.2	15.6
N_2	Nitrogen content, % by volume	79 8	80 0	80 7	80 2
C_p	Pitot Tube Coefficient	0 99	0 99	0 99	0 99
	Circular Stack? 1=Y,0=N	1	1	1	
As	Diameter or Dimensions, inches:	4 00	4 00	4.00	4.00
Q	Sample Run Duration, minutes	60	60	60	60
D_n	Nozzle Diameter, inches	0 195	0.183	0 183	0 187
	CALCULATED DATA				
A_n	Nozzle Area, ft^2	0 000207	0 000183	0 000183	0 000191
$V_{m(std)}$	Standard Meter Volume, ft^3	47 172	42 863	44 329	44 788
$V_{m(std)}$	Standard Meter Volume, m^3	1 336	1.214	1 255	1 268
Q_m	Average Sampling Rate, dscfm	0 786	0.714	0.739	0 746
P_s	Stack Pressure, inches Hg	31 35	30 87	30.87	31 03
B_{ws}	Moisture, % by volume	4 6	4.7	5 2	4 8
$B_{ws(sat)}$	Moisture (at saturation), % by volume	5680.5	5768.4	7181.8	6210.2
V_{wstd}	Standard Water Vapor Volume, ft^3	2 273	2.109	2 434	2.272
$1-B_{ws}$	Dry Mole Fraction	0.954	0.953	0.948	0.952
M_d	Molecular Weight (d b), lb/lb•mole	29 32	29 33	29 26	29 31
M_s	Molecular Weight (w.b), lb/lb•mole	28.80	28.80	28 68	28.76
V_s	Stack Gas Velocity, ft/s	125.2	128.2	131 7	128 3
A	Stack Area, ft^2	0.1	0.1	0.1	0.09
Q_a	Stack Gas Volumetric flow, acfm	655	671	689	672
Q_s	Stack Gas Volumetric flow, dscfm	352	354	353	353
Q_s	Stack Gas Volumetric flow, dscmm	10	10	10	10
I	Isokinetic Sampling Ratio, %	94.0	96.3	100.1	96.8

Summary of Stack Gas Parameters and Test Results
Generator Testing
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Generator - 25% Loading
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	RUN NUMBER	***25-5-1***	***25-5-2***	***25-5-3***	
	RUN DATE	***9/9/2003***	***9/9/2003***	***9/9/2003***	***Average***
	RUN TIME	***0809-0909***	***0925-1025***	***1042-1142***	
	EMISSIONS DATA				
	Particulate Matter				
PM	Filter Weight Gain, mg	12.85	5 85	11.95	
PM	Beaker Weight Gain, mg	23.6	22.85	15.5	
PM	Total Catch, g	0 0365	0.0287	0.0275	0.0309
C_{PM}	**Concentration, gr/dscf**	**1.19E-02**	**1.03E-02**	**9.56E-03**	**1.06E-02**
C_{PM}	**Concentration, lb/dscf**	**1.70E-06**	**1.48E-06**	**1.37E-06**	**1.51E-06**
E_{PM}	**Emission Rate, lb/hr**	**3.60E-02**	**3.14E-02**	**2.89E-02**	**3.21E-02**
	Condensible Matter				
PM	Organic Gain, mg	12 5	10 7	12	
PM	Aqueous Gain, mg	15.3	12.3	23.7	
PM	Total Catch, g	0.0278	0.0230	0.0357	0.03
C_{PM}	**Concentration, gr/dscf**	**9.09E-03**	**8.28E-03**	**1.24E-02**	**9.93E-03**
C_{PM}	**Concentration, lb/dscf**	**1.30E-06**	**1.18E-06**	**1.78E-06**	**1.42E-06**
E_{PM}	**Emission Rate, lb/hr**	**2.74E-02**	**2.52E-02**	**3.76E-02**	**3.01E-02**
	Total Particulate Matter				
PM	Total Catch, g	6 43E-02	5 17E-02	6.32E-02	0 06
C_{PM}	**Concentration, gr/dscf**	**2.10E-02**	**1.86E-02**	**2.20E-02**	**0.02**
C_{PM}	**Concentration, lb/dscf**	**3.00E-06**	**2.66E-06**	**3.14E-06**	**0.00**
E_{PM}	**Emission Rate, lb/hr**	**6.34E-02**	**5.65E-02**	**6.65E-02**	**0.06**

Summary of Stack Gas Parameters and Test Results
Generator Testing
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US EPA Test Method 5 - Particulate Matter
Generator - 50% Loading
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	RUN NUMBER	***50-5-1***	***50-5-2***	***50-5-3***	
	RUN DATE	***9/9/2003***	***9/9/2003***	***9/9/2003***	***Average***
	RUN TIME	***1155-1255***	***1310-1410***	***1424-1524***	
	MEASURED DATA				
P_{static}	Stack Static Pressure, inches H_2O	3 50	3 50	4 00	3 67
y	Meter Box Correction Factor	1 006	1 006	1 006	1 006
P_{bar}	Barometric Pressure, inches Hg	30.69	30 69	30 69	30 69
V_m	Sample Volume, ft^3	43 904	8 996	44 623	32 508
$Dp^{1/2}$	Average Square Root Dp, (in $H_2O)^{1/2}$	1 4830	1 5000	1 5000	1.4943
DH	Avg Meter Orifice Pressure, in H_2O	1 66	0 16	1.68	1 17
T_m	Average Meter Temperature, °F	91	89	94	91
T_s	Average Stack Temperature, °F	595	617	620	611
V_{lc}	Condensate Collected, ml	50.1	8 5	46.4	35 0
CO_2	Carbon Dioxide content, % by volume	4 9	4 9	4 8	4 9
O_2	Oxygen content, % by volume	14 7	14 6	14 7	14 7
N_2	Nitrogen content, % by volume	80 4	80 5	80 5	80 5
C_p	Pitot Tube Coefficient	0.99	0.99	0 99	0 99
	Circular Stack? 1=Y,0=N	1	1	1	
As	Diameter or Dimensions, inches	4 00	4.00	4 00	4 00
Q	Sample Run Duration, minutes	60	60	60	60
D_n	Nozzle Diameter, inches	0 183	0 120	0 183	0 162
	CALCULATED DATA				
A_n	Nozzle Area, ft^2	0 000183	0 000079	0 000183	0 000148
$V_{m(std)}$	Standard Meter Volume, ft^3	43.568	8 928	44 044	32 180
$V_{m(std)}$	Standard Meter Volume, m^3	1 234	0 253	1 247	0.911
Q_m	Average Sampling Rate, dscfm	0.726	0.149	0.734	0.536
P_s	Stack Pressure, inches Hg	30.95	30 95	30 98	30 96
B_{ws}	Moisture, % by volume	5 1	4 3	4 7	4 7
$B_{ws(sat)}$	Moisture (at saturation), % by volume	10263.2	12047.5	12292.4	11534.4
V_{wstd}	Standard Water Vapor Volume, ft^3	2 358	0.400	2.184	1 647
$1-B_{ws}$	Dry Mole Fraction	0.949	0.957	0.953	0.953
M_d	Molecular Weight (d b.), lb/lb•mole	29 37	29 37	29 36	29.37
M_s	Molecular Weight (w.b), lb/lb•mole	28.79	28.88	28.82	28.83
V_s	Stack Gas Velocity, ft/s	136.6	139.4	139 6	138 5
A	Stack Area, ft^2	0.1	0.1	0.1	0.09
Q_a	Stack Gas Volumetric flow, acfm	715	730	731	725
Q_s	Stack Gas Volumetric flow, dscfm	351	354	352	353
Q_s	Stack Gas Volumetric flow, dscmm	10	10	10	10
I	Isokinetic Sampling Ratio, %	98.8	46.7	99.5	81.7

Summary of Stack Gas Parameters and Test Results
Generator Testing
Scott AFB
US EPA Test Method 5 - Particulate Matter
Generator - 50% Loading

	RUN NUMBER	***50-5-1***	***50-5-2***	***50-5-3***	
	RUN DATE	***9/9/2003***	***9/9/2003***	***9/9/2003***	***Average***
	RUN TIME	***1155-1255***	***1310-1410***	***1424-1524***	
	EMISSIONS DATA				
	Particulate Matter				
PM	Filter Weight Gain, mg	16 4	2 55	14.05	
PM	Beaker Weight Gain, mg	25.7	12.85	34.7	
PM	Total Catch, g	0 0421	0.0154	0.0488	0.0354
C_{PM}	**Concentration, gr/dscf**	**1.49E-02**	**2.66E-02**	**1.71E-02**	**1.95E-02**
C_{PM}	**Concentration, lb/dscf**	**2.13E-06**	**3.80E-06**	**2.44E-06**	**2.79E-06**
E_{PM}	**Emission Rate, lb/hr**	**4.49E-02**	**8.08E-02**	**5.16E-02**	**5.91E-02**
	Condensible Matter				
PM	Organic Gain, mg	11 3	3.4	12.6	
PM	Aqueous Gain, mg	33.5	7.5	33.8	
PM	Total Catch, g	0.0448	0.0109	0.0464	0.03
C_{PM}	**Concentration, gr/dscf**	**1.59E-02**	**1.88E-02**	**1.63E-02**	**1.70E-02**
C_{PM}	**Concentration, lb/dscf**	**2.27E-06**	**2.69E-06**	**2.32E-06**	**2.43E-06**
E_{PM}	**Emission Rate, lb/hr**	**4.77E-02**	**5.72E-02**	**4.91E-02**	**5.13E-02**
	Total Particulate Matter				
PM	Total Catch, g	8 69E-02	2 63E-02	9 52E-02	0.07
C_{PM}	**Concentration, gr/dscf**	**3.08E-02**	**4.55E-02**	**3.33E-02**	**0.04**
C_{PM}	**Concentration, lb/dscf**	**4.40E-06**	**6.49E-06**	**4.76E-06**	**0.00**
E_{PM}	**Emission Rate, lb/hr**	**9.26E-02**	**1.38E-01**	**1.01E-01**	**0.11**

Summary of Stack Gas Parameters and Test Results
Generator Testing
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US EPA Test Method 5 - Particulate Matter
Generator - 75% Loading

	RUN NUMBER	*75-5-1*	*75-5-2*	*75-5-3*	
	RUN DATE	*9/9/2003*	*9/9/2003*	*9/9/2003*	*Average*
	RUN TIME	*1540-1640*	*1652-1707*	*1725-1825*	
	MEASURED DATA				
P_{static}	Stack Static Pressure, inches H_2O	5 00	4 50	4 50	4 67
y	Meter Box Correction Factor	1 006	1 006	1 006	1 006
P_{bar}	Barometric Pressure, inches Hg	30 69	30 69	30.69	30 69
V_m	Sample Volume, ft^3	44 648	7 694	43.054	31 799
$Dp^{1/2}$	Average Square Root Dp, (in $H_2O)^{1/2}$	1 5000	1 5684	1 5684	1.5456
DH	Avg Meter Orifice Pressure, in H_2O	1 70	1 18	1 60	1 49
T_m	Average Meter Temperature, °F	96	93	93	94
T_s	Average Stack Temperature, °F	620	750	750	707
V_{lc}	Condensate Collected, ml	63.4	11 2	61 1	45.2
CO_2	Carbon Dioxide content, % by volume	6 2	6 2	6 1	6.2
O_2	Oxygen content, % by volume	12 8	12 8	12.9	12 8
N_2	Nitrogen content, % by volume	81 0	81 0	81.0	81.0
C_p	Pitot Tube Coefficient	0 99	0 99	0 99	0 99
	Circular Stack? 1=Y,0=N	1	1	1	
As	Diameter or Dimensions, inches	4 00	4 00	4 00	4 00
Q	Sample Run Duration, minutes	60	15	60	45
D_n	Nozzle Diameter, inches	0 183	0 183	0 183	0 183
	CALCULATED DATA				
A_n	Nozzle Area, ft^2	0 000183	0 000183	0 000183	0 000183
$V_{m(std)}$	Standard Meter Volume, ft^3	43 952	7 606	42 564	31.374
$V_{m(std)}$	Standard Meter Volume, m^3	1 245	0 215	1.205	0.888
Q_m	Average Sampling Rate, dscfm	0 733	0 507	0.709	0 650
P_s	Stack Pressure, inches Hg	31.06	31.02	31.02	31.03
B_{ws}	Moisture, % by volume	6.4	6 5	6 3	6 4
$B_{ws(sat)}$	Moisture (at saturation), % by volume	12263.3	27767.1	27767.1	22599.2
V_{wstd}	Standard Water Vapor Volume, ft^3	2 984	0 527	2 876	2 129
$1-B_{ws}$	Dry Mole Fraction	0.936	0.935	0.937	0.936
M_d	Molecular Weight (d b), lb/lb•mole	29.50	29 50	29 49	29 50
M_s	Molecular Weight (w.b), lb/lb•mole	28.77	28 76	28.76	28.77
V_s	Stack Gas Velocity, ft/s	139 6	154 6	154 6	149 6
A	Stack Area, ft^2	0.1	0.1	0.1	0.09
Q_a	Stack Gas Volumetric flow, acfm	731	809	809	783
Q_s	Stack Gas Volumetric flow, dscfm	347	342	343	344
Q_s	Stack Gas Volumetric flow, dscmm	10	10	10	10
I	Isokinetic Sampling Ratio, %	100.8	70.8	98.9	90.2

Summary of Stack Gas Parameters and Test Results
Generator Testing
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Generator - 75% Loading
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	RUN NUMBER	***75-5-1***	***75-5-2***	***75-5-3***	
	RUN DATE	***9/9/2003***	***9/9/2003***	***9/9/2003***	***Average***
	RUN TIME	***1540-1640***	***1652-1707***	***1725-1825***	
	EMISSIONS DATA				
	Particulate Matter				
PM	Filter Weight Gain, mg	50 55	3 6	9.2	
PM	Beaker Weight Gain, mg	28.15	11.9	17.45	
PM	Total Catch, g	0.0787	0 0155	0.0267	0.0403
C_{PM}	**Concentration, gr/dscf**	**2.76E-02**	**3.15E-02**	**9.66E-03**	**2.29E-02**
C_{PM}	**Concentration, lb/dscf**	**3.95E-06**	**4.49E-06**	**1.38E-06**	**3.27E-06**
E_{PM}	**Emission Rate, lb/hr**	**8.22E-02**	**9.23E-02**	**2.84E-02**	**6.76E-02**
	Condensible Matter				
PM	Organic Gain, mg	1 9	2 7	17	
PM	Aqueous Gain, mg	39.7	5.7	36.6	
PM	Total Catch, g	0.0416	0.0084	0 0536	0.03
C_{PM}	**Concentration, gr/dscf**	**1.46E-02**	**1.70E-02**	**1.94E-02**	**1.70E-02**
C_{PM}	**Concentration, lb/dscf**	**2.09E-06**	**2.43E-06**	**2.78E-06**	**2.43E-06**
E_{PM}	**Emission Rate, lb/hr**	**4.35E-02**	**5.00E-02**	**5.71E-02**	**5.02E-02**
	Total Particulate Matter				
PM	Total Catch, g	1 20E-01	2.39E-02	8 03E-02	0 07
C_{PM}	**Concentration, gr/dscf**	**4.22E-02**	**4.85E-02**	**2.91E-02**	**0.04**
C_{PM}	**Concentration, lb/dscf**	**6.03E-06**	**6.93E-06**	**4.16E-06**	**0.00**
E_{PM}	**Emission Rate, lb/hr**	**1.26E-01**	**1.42E-01**	**8.55E-02**	**0.12**

Summary of Stack Gas Parameters and Test Results
Generator Testing
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Generator - 100% Loading
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	RUN NUMBER RUN DATE RUN TIME	100-5-1 9/10/2003 0758-0858	100-5-2 9/10/2003 0910-0925	100-5-3 9/10/2003 0945-1045	100-5-4 9/10/2003 1058-1158	Average
	MEASURED DATA					
P_{static}	Stack Static Pressure, inches H_2O	4 00	4 00	5 00	5 50	4 63
y	Meter Box Correction Factor	1 006	1 006	1.006	1.006	1 006
P_{bar}	Barometric Pressure, inches Hg	30 68	30 68	30 68	30 68	30 68
V_m	Sample Volume, ft^3	42 285	6 751	42 617	42 196	33 462
$Dp^{1/2}$	Average Square Root Dp, (in $H_2O)^{1/2}$	1 5692	1 5716	1 5122	1 4697	1 5307
DH	Avg Meter Orifice Pressure, in H_2O	1 58	0 88	1 58	1 50	1 38
T_m	Average Meter Temperature, °F	69	74	83	90	79
T_s	Average Stack Temperature, °F	728	661	674	683	687
V_{lc}	Condensate Collected, ml	54 7	3 3	55 3	55.0	42.1
CO_2	Carbon Dioxide content, % by volume	5 4	5 4	5 6	5 6	5 5
O_2	Oxygen content, % by volume	13 7	13 7	13 3	13.6	13 6
N_2	Nitrogen content, % by volume	80 9	80 9	81 1	80 8	80 9
C_p	Pitot Tube Coefficient	0 99	0 99	0 99	0 99	0 99
	Circular Stack? 1=Y,0=N	1	1	1	1	
As	Diameter or Dimensions, inches	4 00	4 00	4 00	4 00	4 00
Q	Sample Run Duration, minutes	60	15	60	60	49
D_n	Nozzle Diameter, inches	0 183	0 183	0 183	0 183	0.183
	CALCULATED DATA					
A_n	Nozzle Area, ft^2	0 000183	0 000183	0 000183	0 000183	0 000183
$V_{m(std)}$	Standard Meter Volume, ft^3	43 692	6 898	42 892	41.927	33 852
$V_{m(std)}$	Standard Meter Volume, m^3	1 237	0 195	1 215	1 187	0.959
Q_m	Average Sampling Rate, dscfm	0.728	0.460	0 715	0 699	0 650
P_s	Stack Pressure, inches Hg	30.97	30.97	31.05	31.08	31 02
B_{ws}	Moisture, % by volume	5.6	2 2	5.7	5.8	4 8
$B_{ws(sat)}$	Moisture (at saturation), % by volume	24547.0	16255.9	17638.9	18651.0	19273.2
V_{wstd}	Standard Water Vapor Volume, ft^3	2 575	0 155	2 603	2.589	1 980
$1-B_{ws}$	Dry Mole Fraction	0.944	0.978	0.943	0.942	0.952
M_d	Molecular Weight (d b), lb/lb•mole	29.41	29 41	29 43	29 44	29 42
M_s	Molecular Weight (w.b), lb/lb•mole	28.78	29.16	28 77	28.77	28.87
V_s	Stack Gas Velocity, ft/s	153 3	148 2	144 2	140 6	146 6
A	Stack Area, ft^2	0.1	0.1	0.1	0.1	0.09
Q_a	Stack Gas Volumetric flow, acfm	803	776	755	736	767
Q_s	Stack Gas Volumetric flow, dscfm	349	370	344	333	349
Q_s	Stack Gas Volumetric flow, dscmm	10	10	10	9	10
I	Isokinetic Sampling Ratio, %	99.8	59.4	99.4	100.4	89.7

Summary of Stack Gas Parameters and Test Results
Generator Testing
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Generator - 100% Loading
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	RUN NUMBER	***100-5-1***	***100-5-2***	***100-5-3***	***100-5-4***	
	RUN DATE	***9/10/2003***	***9/10/2003***	***9/10/2003***	***9/10/2003***	***Average***
	RUN TIME	***0758-0858***	***0910-0925***	***0945-1045***	***1058-1158***	
	EMISSIONS DATA					
	Particulate Matter					
PM	Filter Weight Gain, mg	2 75	4.65	3.65	3.35	
PM	Beaker Weight Gain, mg	8.85	5.5	9.2	8.8	
PM	Total Catch, g	0 0116	0.0102	0.0129	0.0122	0 0117
C_{PM}	**Concentration, gr/dscf**	**4.10E-03**	**2.27E-02**	**4.62E-03**	**4.47E-03**	**8.98E-03**
C_{PM}	**Concentration, lb/dscf**	**5.85E-07**	**3.24E-06**	**6.60E-07**	**6.39E-07**	**1.28E-06**
E_{PM}	**Emission Rate, lb/hr**	**1.22E-02**	**7.20E-02**	**1.36E-02**	**1.28E-02**	**2.77E-02**
	Condensible Matter					
PM	Organic Gain, mg	13 2	1 7	6 3	10.3	
PM	Aqueous Gain, mg	24.3	2	49.1	35	
PM	Total Catch, g	0 0375	0.0037	0.0554	0.0453	0.03
C_{PM}	**Concentration, gr/dscf**	**1.32E-02**	**8.28E-03**	**1.99E-02**	**1.67E-02**	**1.50E-02**
C_{PM}	**Concentration, lb/dscf**	**1.89E-06**	**1.18E-06**	**2.85E-06**	**2.38E-06**	**2.14E-06**
E_{PM}	**Emission Rate, lb/hr**	**3.96E-02**	**2.62E-02**	**5.87E-02**	**4.75E-02**	**4.42E-02**
	Total Particulate Matter					
PM	Total Catch, g	4 91E-02	1 39E-02	6.83E-02	5 75E-02	0 05
C_{PM}	**Concentration, gr/dscf**	**1.73E-02**	**3.10E-02**	**2.46E-02**	**2.11E-02**	**0.03**
C_{PM}	**Concentration, lb/dscf**	**2.48E-06**	**4.43E-06**	**3.51E-06**	**3.02E-06**	**0.00**
E_{PM}	**Emission Rate, lb/hr**	**5.18E-02**	**9.82E-02**	**7.24E-02**	**6.03E-02**	**0.08**

PARTICULATE
MF2 LIGHTING UNIT GENERATOR

Summary of Stack Gas Parameters and Test Results
Generator Testing
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Light Generator
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	RUN NUMBER	***L-5-1***	***L-5-2***	***L-5-3***	
	RUN DATE	***9/10/2003***	***9/10/2003***	***9/10/2003***	**Average**
	RUN TIME	***1313-1413***	***1429-1529***	***1542-1642***	
	MEASURED DATA				
P_{static}	Stack Static Pressure, inches H_2O	0.01	0 01	0 01	0.01
y	Meter Box Correction Factor	1 006	1 006	1 006	1 006
P_{bar}	Barometric Pressure, inches Hg	30 68	30 69	30 69	30 69
V_m	Sample Volume, ft^3	28 872	28 995	28 844	28 904
$Dp^{1/2}$	Average Square Root Dp, (in $H_2O)^{1/2}$	0 1039	0 1039	0 1039	0 1039
DH	Avg Meter Orifice Pressure, in H_2O	0 64	0.64	0 64	0 64
T_m	Average Meter Temperature, °F	91	94	95	93
T_s	Average Stack Temperature, °F	263	263	263	263
V_{lc}	Condensate Collected, ml	21 6	34 0	31 9	29.2
CO_2	Carbon Dioxide content, % by volume	4 1	4 1	4 3	4.2
O_2	Oxygen content, % by volume	14 9	15 1	15 3	15 1
N_2	Nitrogen content, % by volume	81 0	80 8	80 4	80 7
C_p	Pitot Tube Coefficient	0 99	0 99	0 99	0 99
	Circular Stack? 1=Y,0=N:	1	1	1	
As	Diameter or Dimensions, inches:	4 00	4 00	4 00	4 00
Q	Sample Run Duration, minutes	60	60	60	60
D_n	Nozzle Diameter, inches	0 495	0.495	0 495	0.495
	CALCULATED DATA				
A_n	Nozzle Area, ft^2	0 001336	0 001336	0 001336	0 001336
$V_{m(std)}$	Standard Meter Volume, ft^3	28 598	28 548	28 333	28 493
$V_{m(std)}$	Standard Meter Volume, m^3	0 810	0 808	0 802	0.807
Q_m	Average Sampling Rate, dscfm	0.477	0.476	0.472	0.475
P_s	Stack Pressure, inches Hg	30.68	30.69	30.69	30 69
B_{ws}	Moisture, % by volume	3 4	5 3	5 0	4.6
$B_{ws(sat)}$	Moisture (at saturation), % by volume	248.8	248.7	248.7	248.7
V_{wstd}	Standard Water Vapor Volume, ft^3	1 017	1 600	1 502	1 373
$1-B_{ws}$	Dry Mole Fraction	0.966	0.947	0.950	0.954
M_d	Molecular Weight (d b), lb/lb•mole	29.25	29 26	29 30	29 27
M_s	Molecular Weight (w.b), lb/lb•mole	28.87	28.66	28.73	28.75
V_s	Stack Gas Velocity, ft/s	7.9	8 0	8.0	8 0
A	Stack Area, ft^2	0.1	0.1	0.1	0.09
Q_a	Stack Gas Volumetric flow, acfm	42	42	42	42
Q_s	Stack Gas Volumetric flow, dscfm	30	30	30	30
Q_s	Stack Gas Volumetric flow, dscmm	1	1	1	1
I	Isokinetic Sampling Ratio, %	103.5	105.0	104.0	104.2

Summary of Stack Gas Parameters and Test Results
Generator Testing
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Light Generator

	RUN NUMBER	***L-5-1***	***L-5-2***	***L-5-3***	
	RUN DATE	***9/10/2003***	***9/10/2003***	***9/10/2003***	***Average***
	RUN TIME	***1313-1413***	***1429-1529***	***1542-1642***	
	EMISSIONS DATA				
	Particulate Matter				
PM	Filter Weight Gain, mg	7.55	7 75	6 65	
PM	Beaker Weight Gain, mg	5.4	4.45	4.35	
PM	Total Catch, g	0.0130	0.0122	0.0110	0.0121
C_{PM}	**Concentration, gr/dscf**	**6.99E-03**	**6.59E-03**	**5.99E-03**	**6.52E-03**
C_{PM}	**Concentration, lb/dscf**	**9.98E-07**	**9.42E-07**	**8.56E-07**	**9.32E-07**
E_{PM}	**Emission Rate, lb/hr**	**1.80E-03**	**1.67E-03**	**1.52E-03**	**1.67E-03**
	Condensible Matter				
PM	Organic Gain, mg	3 5	2 1	4	
PM	Aqueous Gain, mg	22.2	18.3	24.6	
PM	Total Catch, g	0.0257	0 0204	0.0286	0.02
C_{PM}	**Concentration, gr/dscf**	**1.39E-02**	**1.10E-02**	**1.56E-02**	**1.35E-02**
C_{PM}	**Concentration, lb/dscf**	**1.98E-06**	**1.58E-06**	**2.23E-06**	**1.93E-06**
E_{PM}	**Emission Rate, lb/hr**	**3.57E-03**	**2.80E-03**	**3.96E-03**	**3.44E-03**
	Total Particulate Matter				
PM	Total Catch, g	2.22E+01	1.83E+01	2.46E+01	21 71
C_{PM}	**Concentration, gr/dscf**	**2.09E-02**	**1.76E-02**	**2.16E-02**	**0.02**
C_{PM}	**Concentration, lb/dscf**	**2.98E-06**	**2.52E-06**	**3.08E-06**	**0.00**
E_{PM}	**Emission Rate, lb/hr**	**5.38E-03**	**4.47E-03**	**5.48E-03**	**5.11E-03**

VOLATILE ORGANIC COMPOUNDS

Scott AFB Generator Testing

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	0030-1 (-86)	0030-2 (MF2)	Average
Acetone			
Molecular Weight, g/g-mole	58 08	58.08	
Target Catch, µg	0.84	0.42	0.63
Concentration, mg/dscm [a]	8 31E-02	4.18E-02	0 06
Concentration, ppbvd [b]	3.44E+01	1 73E+01	25 86
Emission Rate, lb/hr [c]	1.07E-04	5 38E-05	0 00
Emission Rate, lb/1000 lb fuel	2.12E-02	2.69E-02	0 02
Benzene			
Molecular Weight, g/g-mole	78 11	78 11	
Target Catch, µg	1 52	3 40	2 46
Concentration, mg/dscm [a]	1 51E-01	3.38E-01	0 24
Concentration, ppbvd [b]	4 66E+01	1.04E+02	75.35
Emission Rate, lb/hr [c]	1.95E-04	4 36E-04	0.00
Emission Rate, lb/1000 lb fuel	3.87E-02	2.18E-01	0.13
Bromodichloromethane			
Molecular Weight, g/g-mole	163 83	163 83	
Target Catch, µg	*0 01*	*0 01*	*0.01*
Concentration, mg/dscm [a]	*9 94E-04*	*9 94E-04*	*0 00*
Concentration, ppbvd [b]	*1 46E-01*	*1 46E-01*	*0.15*
Emission Rate, lb/hr [c]	*1 28E-06*	*1 28E-06*	*0.00*
Emission Rate, lb/1000 lb fuel	*2 54E-04*	*6 40E-04*	*0 00*
Bromoform			
Molecular Weight, g/g-mole	252 73	252.73	
Target Catch, µg	*0.01*	*0 01*	*0 01*
Concentration, mg/dscm [a]	*9 94E-04*	*9 94E-04*	*0 00*
Concentration, ppbvd [b]	*9.46E-02*	*9 46E-02*	*0 09*
Emission Rate, lb/hr [c]	*1 28E-06*	*1 28E-06*	*0 00*
Emission Rate, lb/1000 lb fuel	*2.54E-04*	*6.40E-04*	*0.00*

[a] Milligrams per dry standard cubic meter at 68° F (20° C) and 1 atm.

[b] Parts per billion by volume.

[c] Pounds per hour

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	0030-1 (-86)	0030-2 (MF2)	Average
Bromomethane			
Molecular Weight, g/g-mole	94.94	94.94	
Target Catch, µg	0 13	0.01	0 07
Concentration, mg/dscm [a]	1 29E-02	1 09E-03	0.01
Concentration, ppbvd [b]	3 27E+00	2 77E-01	1 78
Emission Rate, lb/hr [c]	1.67E-05	1 41E-06	0 00
Emission Rate, lb/1000 lb fuel	3 30E-03	7 04E-04	0 00
2-Butanone			
Molecular Weight, g/g-mole	72 11	72.11	
Target Catch, µg	0 19	0.46	0.33
Concentration, mg/dscm [a]	1 89E-02	4 57E-02	0 03
Concentration, ppbvd [b]	6.30E+00	1 53E+01	10 78
Emission Rate, lb/hr [c]	2.43E-05	5 89E-05	0 00
Emission Rate, lb/1000 lb fuel	4 83E-03	2.95E-02	0 02
1,3 Butadiene			
Molecular Weight, g/g-mole	54 09	54 09	
Target Catch, µg	*0.05*	*0.05*	*0 05*
Concentration, mg/dscm [a]	*4.97E-03*	*4 97E-03*	*0.00*
Concentration, ppbvd [b]	*2 21E+00*	*2 21E+00*	*2 21*
Emission Rate, lb/hr [c]	*6.41E-06*	*6.41E-06*	*0.00*
Emission Rate, lb/1000 lb fuel	*1 27E-03*	*3 20E-03*	*0.00*
Carbon disulfide			
Molecular Weight, g/g-mole	76.13	76.13	
Target Catch, µg	*0 01*	*0.01*	*0 01*
Concentration, mg/dscm [a]	*9 94E-04*	*9 94E-04*	*0.00*
Concentration, ppbvd [b]	*3 14E-01*	*3.14E-01*	*0.31*
Emission Rate, lb/hr [c]	*1 28E-06*	*1.28E-06*	*0 00*
Emission Rate, lb/1000 lb fuel	*2.54E-04*	*6.40E-04*	*0.00*

[a] Milligrams per dry standard cubic meter at 68° F (20° C) and 1 atm.

[b] Parts per billion by volume.

[c] Pounds per hour

Scott AFB Generator Testing

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	0030-1 (-86)	0030-2 (MF2)	Average
Carbon tetrachloride			
Molecular Weight, g/g-mole	153.84	153 84	
Target Catch, µg	0 01	0 01	0.01
Concentration, mg/dscm [a]	9 94E-04	9 94E-04	0 00
Concentration, ppbvd [b]	1 55E-01	1 55E-01	0.16
Emission Rate, lb/hr [c]	1 28E-06	1 28E-06	0 00
Emission Rate, lb/1000 lb fuel	2 54E-04	6.40E-04	0 00
Chlorobenzene			
Molecular Weight, g/g-mole	112 56	112.56	
Target Catch, µg	0 01	0 01	0 01
Concentration, mg/dscm [a]	1 39E-03	1 39E-03	0.00
Concentration, ppbvd [b]	2 97E-01	2 97E-01	0 30
Emission Rate, lb/hr [c]	1 79E-06	1 79E-06	0.00
Emission Rate, lb/1000 lb fuel	3 56E-04	8.96E-04	0.00
Chlorodibromomethane			
Molecular Weight, g/g-mole	208.28	208 28	
Target Catch, µg	0 01	0 01	0 01
Concentration, mg/dscm [a]	1 39E-03	1.39E-03	0.00
Concentration, ppbvd [b]	1 61E-01	1 61E-01	0.16
Emission Rate, lb/hr [c]	1 79E-06	1 79E-06	0.00
Emission Rate, lb/1000 lb fuel	3 56E-04	8.96E-04	0 00
Chloroethane			
Molecular Weight, g/g-mole	65 51	65 51	
Target Catch, µg	0.01	0 01	0.01
Concentration, mg/dscm [a]	1 39E-03	1 39E-03	0 00
Concentration, ppbvd [b]	5 11E-01	5 11E-01	0.51
Emission Rate, lb/hr [c]	1 79E-06	1 79E-06	0 00
Emission Rate, lb/1000 lb fuel	3.56E-04	8 96E-04	0.00
Chloroform			
Molecular Weight, g/g-mole	119.39	119 39	
Target Catch, µg	0 01	0.01	0.01
Concentration, mg/dscm [a]	1 39E-03	1 39E-03	0.00
Concentration, ppbvd [b]	2 80E-01	2 80E-01	0.28
Emission Rate, lb/hr [c]	1 79E-06	1 79E-06	0.00
Emission Rate, lb/1000 lb fuel	3.56E-04	8.96E-04	0.00

[a] Milligrams per dry standard cubic meter at 68° F (20° C) and 1 atm.

[b] Parts per billion by volume.

[c] Pounds per hour

030174.0006.002

	0030-1 (-86)	0030-2 (MF2)	Average
Chloromethane			
Molecular Weight, g/g-mole	50 49	50 49	
Target Catch, µg	*0 01*	*0 01*	*0.01*
Concentration, mg/dscm [a]	*9 94E-04*	*9 94E-04*	*0 00*
Concentration, ppbvd [b]	*4 74E-01*	*4 74E-01*	*0.47*
Emission Rate, lb/hr [c]	*1 28E-06*	*1 28E-06*	*0 00*
Emission Rate, lb/1000 lb fuel	*2 54E-04*	*6.40E-04*	*0 00*
1,1-Dichloroethane			
Molecular Weight, g/g-mole	98 96	98 96	
Target Catch, µg	*0 01*	*0 01*	*0 01*
Concentration, mg/dscm [a]	*1 39E-03*	*1 39E-03*	*0 00*
Concentration, ppbvd [b]	*3 38E-01*	*3 38E-01*	*0 34*
Emission Rate, lb/hr [c]	*1 79E-06*	*1 79E-06*	*0.00*
Emission Rate, lb/1000 lb fuel	*3 56E-04*	*8.96E-04*	*0 00*
1,2-Dichloroethane			
Molecular Weight, g/g-mole	98 96	98 96	
Target Catch, µg	*0 01*	*0 01*	*0 01*
Concentration, mg/dscm [a]	*1 39E-03*	*1 39E-03*	*0 00*
Concentration, ppbvd [b]	*3 38E-01*	*3 38E-01*	*0.34*
Emission Rate, lb/hr [c]	*1 79E-06*	*1 79E-06*	*0 00*
Emission Rate, lb/1000 lb fuel	*3 56E-04*	*8.96E-04*	*0.00*
1,1-Dichloroethene			
Molecular Weight, g/g-mole	96 94	96 94	
Target Catch, µg	*0 01*	*0.01*	*0 01*
Concentration, mg/dscm [a]	*1 39E-03*	*1 39E-03*	*0 00*
Concentration, ppbvd [b]	*3 45E-01*	*3.45E-01*	*0 35*
Emission Rate, lb/hr [c]	*1 79E-06*	*1.79E-06*	*0 00*
Emission Rate, lb/1000 lb fuel	*3.56E-04*	*8.96E-04*	*0.00*

[a] Milligrams per dry standard cubic meter at 68° F (20° C) and 1 atm.

[b] Parts per billion by volume

[c] Pounds per hour

Scott AFB Generator Testing

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	0030-1 (-86)	0030-2 (MF2)	Average
cis-1,2-Dichloroethene			
Molecular Weight, g/g-mole	96.94	96 94	
Target Catch, µg	*0 01*	*0 01*	*0 01*
Concentration, mg/dscm [a]	*1 39E-03*	*1 39E-03*	*0 00*
Concentration, ppbvd [b]	*3 45E-01*	*3 45E-01*	*0 35*
Emission Rate, lb/hr [c]	*1 79E-06*	*1 79E-06*	*0.00*
Emission Rate, lb/1000 lb fuel	*3 56E-04*	*8 96E-04*	*0 00*
trans-1,2-Dichloroethene			
Molecular Weight, g/g-mole	96 94	96.94	
Target Catch, µg	*0.01*	*0 01*	*0 01*
Concentration, mg/dscm [a]	*1.39E-03*	*1 39E-03*	*0.00*
Concentration, ppbvd [b]	*3 45E-01*	*3 45E-01*	*0.35*
Emission Rate, lb/hr [c]	*1 79E-06*	*1 79E-06*	*0 00*
Emission Rate, lb/1000 lb fuel	*3 56E-04*	*8.96E-04*	*0.00*
1,2-Dichloropropane			
Molecular Weight, g/g-mole	112.99	112 99	
Target Catch, µg	*0 01*	*0.01*	*0.01*
Concentration, mg/dscm [a]	*1 39E-03*	*1 39E-03*	*0.00*
Concentration, ppbvd [b]	*2 96E-01*	*2 96E-01*	*0 30*
Emission Rate, lb/hr [c]	*1 79E-06*	*1 79E-06*	*0 00*
Emission Rate, lb/1000 lb fuel	*3.56E-04*	*8.96E-04*	*0.00*

[a] Milligrams per dry standard cubic meter at 68° F (20° C) and 1 atm.

[b] Parts per billion by volume.

[c] Pounds per hour

030174.0006.002

	0030-1 (-86)	0030-2 (MF2)	Average
cis-1,3-Dichloropropene			
Molecular Weight, g/g-mole	110 97	110 97	
Target Catch, µg	*0 01*	*0 01*	*0 01*
Concentration, mg/dscm [a]	*1 39E-03*	*1 39E-03*	*0 00*
Concentration, ppbvd [b]	*3 02E-01*	*3 02E-01*	*0 30*
Emission Rate, lb/hr [c]	*1 79E-06*	*1 79E-06*	*0 00*
Emission Rate, lb/1000 lb fuel	*3 56E-04*	*8.96E-04*	*0 00*
trans-1,3-Dichloropropene			
Molecular Weight, g/g-mole	110 97	110 97	
Target Catch, µg	*0 01*	*0 01*	*0 01*
Concentration, mg/dscm [a]	*1 39E-03*	*1 39E-03*	*0 00*
Concentration, ppbvd [b]	*3 02E-01*	*3.02E-01*	*0.30*
Emission Rate, lb/hr [c]	*1 79E-06*	*1 79E-06*	*0 00*
Emission Rate, lb/1000 lb fuel	*3.56E-04*	*8.96E-04*	*0.00*
Ethylbenzene			
Molecular Weight, g/g-mole	106 17	106 17	
Target Catch, µg	0 44	0.52	0 48
Concentration, mg/dscm [a]	4 37E-02	5.17E-02	0 05
Concentration, ppbvd [b]	9 91E+00	1 17E+01	10 81
Emission Rate, lb/hr [c]	5 64E-05	6.66E-05	0 00
Emission Rate, lb/1000 lb fuel	1.12E-02	3 33E-02	0.02
2-Hexanone			
Molecular Weight, g/g-mole	100 16	100 16	
Target Catch, µg	*0 05*	*0.05*	*0.05*
Concentration, mg/dscm [a]	*4 97E-03*	*4 97E-03*	*0 00*
Concentration, ppbvd [b]	*1 19E+00*	*1 19E+00*	*1 19*
Emission Rate, lb/hr [c]	*6.41E-06*	*6.41E-06*	*0.00*
Emission Rate, lb/1000 lb fuel	*1.27E-03*	*3.20E-03*	*0.00*

[a] Milligrams per dry standard cubic meter at 68° F (20° C) and 1 atm.

[b] Parts per billion by volume.

[c] Pounds per hour

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	0030-1 (-86)	0030-2 (MF2)	Average
Methylene chloride			
Molecular Weight, g/g-mole	84 93	84 93	
Target Catch, µg	0 40	0 55	0.48
Concentration, mg/dscm [a]	4 02E-02	5 47E-02	0.05
Concentration, ppbvd [b]	1 14E+01	1.55E+01	13 43
Emission Rate, lb/hr [c]	5 18E-05	7.05E-05	0 00
Emission Rate, lb/1000 lb fuel	1 03E-02	3.52E-02	0 02
4-Methyl-2-pentanone			
Molecular Weight, g/g-mole	100 16	100.16	
Target Catch, µg	*0 05*	*0 05*	*0 05*
Concentration, mg/dscm [a]	*4 97E-03*	*4 97E-03*	*0 00*
Concentration, ppbvd [b]	*1 19E+00*	*1 19E+00*	*1 19*
Emission Rate, lb/hr [c]	*6.41E-06*	*6.41E-06*	*0 00*
Emission Rate, lb/1000 lb fuel	*1 27E-03*	*3.20E-03*	*0 00*
Styrene			
Molecular Weight, g/g-mole	104 15	104 15	
Target Catch, µg	*0 01*	*0 01*	*0 01*
Concentration, mg/dscm [a]	*9 94E-04*	*9 94E-04*	*0 00*
Concentration, ppbvd [b]	*2 30E-01*	*2 30E-01*	*0.23*
Emission Rate, lb/hr [c]	*1 28E-06*	*1.28E-06*	*0 00*
Emission Rate, lb/1000 lb fuel	*2.54E-04*	*6.40E-04*	*0.00*

[a] Milligrams per dry standard cubic meter at 68° F (20° C) and 1 atm.

[b] Parts per billion by volume.

[c] Pounds per hour

030174.0006.002

	0030-1 (-86)	0030-2 (MF2)	Average
1,1,2,2-Tetrachloroethane			
Molecular Weight, g/g-mole	167.85	167 85	
Target Catch, µg	*0.01*	*0 01*	*0 01*
Concentration, mg/dscm [a]	*1 39E-03*	*1 39E-03*	*0 00*
Concentration, ppbvd [b]	*1 99E-01*	*1 99E-01*	*0 20*
Emission Rate, lb/hr [c]	*1 79E-06*	*1 79E-06*	*0.00*
Emission Rate, lb/1000 lb fuel	*3 56E-04*	*8 96E-04*	*0 00*
Tetrachloroethene			
Molecular Weight, g/g-mole	165.83	165 83	
Target Catch, µg	*0.01*	*0.01*	*0 01*
Concentration, mg/dscm [a]	*1 39E-03*	*1 39E-03*	*0.00*
Concentration, ppbvd [b]	*2 02E-01*	*2 02E-01*	*0 20*
Emission Rate, lb/hr [c]	*1 79E-06*	*1 79E-06*	*0 00*
Emission Rate, lb/1000 lb fuel	*3.56E-04*	*8.96E-04*	*0.00*
Toluene			
Molecular Weight, g/g-mole	94.14	94 14	
Target Catch, µg	0.74	1 40	1.07
Concentration, mg/dscm [a]	7 36E-02	1 39E-01	0 11
Concentration, ppbvd [b]	1 88E+01	3.56E+01	27 18
Emission Rate, lb/hr [c]	9 48E-05	1 79E-04	0 00
Emission Rate, lb/1000 lb fuel	1.88E-02	8.96E-02	0.05

[a] Milligrams per dry standard cubic meter at 68° F (20° C) and 1 atm.

[b] Parts per billion by volume.

[c] Pounds per hour

Scott AFB Generator Testing

030174.0006.002

	0030-1 (-86)	0030-2 (MF2)	Average
1,1,1-Trichloroethane			
Molecular Weight, g/g-mole	133 40	133 40	
Target Catch, µg	*0 01*	*0 01*	*0 01*
Concentration, mg/dscm [a]	*1 39E-03*	*1 39E-03*	*0.00*
Concentration, ppbvd [b]	*2 51E-01*	*2 51E-01*	*0 25*
Emission Rate, lb/hr [c]	*1 79E-06*	*1.79E-06*	*0 00*
Emission Rate, lb/1000 lb fuel	*3 56E-04*	*8.96E-04*	*0.00*
1,1,2-Trichloroethane			
Molecular Weight, g/g-mole	133 40	133 40	
Target Catch, µg	*0 01*	*0.01*	*0.01*
Concentration, mg/dscm [a]	*1 39E-03*	*1 39E-03*	*0 00*
Concentration, ppbvd [b]	*2 51E-01*	*2 51E-01*	*0.25*
Emission Rate, lb/hr [c]	*1 79E-06*	*1 79E-06*	*0.00*
Emission Rate, lb/1000 lb fuel	*3 56E-04*	*8 96E-04*	*0.00*
Trichloroethene			
Molecular Weight, g/g-mole	131.39	131.39	
Target Catch, µg	*0 01*	*0.01*	*0.01*
Concentration, mg/dscm [a]	*1.39E-03*	*1 39E-03*	*0 00*
Concentration, ppbvd [b]	*2 55E-01*	*2 55E-01*	*0.25*
Emission Rate, lb/hr [c]	*1 79E-06*	*1 79E-06*	*0 00*
Emission Rate, lb/1000 lb fuel	*3 56E-04*	*8 96E-04*	*0 00*
Trichlorofluoromethane (Freon 11)			
Molecular Weight, g/g-mole	137 37	137 37	
Target Catch, µg	*0.01*	*0.01*	*0.01*
Concentration, mg/dscm [a]	*9 94E-04*	*9 94E-04*	*0.00*
Concentration, ppbvd [b]	*1 74E-01*	*1 74E-01*	*0 17*
Emission Rate, lb/hr [c]	*1 28E-06*	*1 28E-06*	*0.00*
Emission Rate, lb/1000 lb fuel	*2.54E-04*	*6.40E-04*	*0.00*

[a] Milligrams per dry standard cubic meter at 68° F (20° C) and 1 atm

[b] Parts per billion by volume.

[c] Pounds per hour

Scott AFB Generator Testing

030174.0006.002

	0030-1 (-86)	0030-2 (MF2)	Average
o-Xylene			
Molecular Weight, g/g-mole	106 17	106.17	
Target Catch, µg	0 35	0.57	0 46
Concentration, mg/dscm [a]	1 07E-03	1 07E-03	0 00
Concentration, ppbvd [b]	7 88E+00	1.28E+01	10 36
Emission Rate, lb/hr [c]	4.48E-05	7 30E-05	0.00
Emission Rate, lb/1000 lb fuel	8 90E-03	3 65E-02	0.02
m-Xylene & p-Xylene			
Molecular Weight, g/g-mole	106 17	106.17	
Target Catch, µg	0 84	1 20	1.02
Concentration, mg/dscm [a]	8 33E-02	1.19E-01	0.10
Concentration, ppbvd [b]	1 89E+01	2.70E+01	22 95
Emission Rate, lb/hr [c]	1 07E-04	1 54E-04	0 00
Emission Rate, lb/1000 lb fuel	2.13E-02	7 68E-02	0.05
Vinyl acetate			
Molecular Weight, g/g-mole	86.09	86.09	
Target Catch, µg	*0 05*	*0 05*	*0.05*
Concentration, mg/dscm [a]	*4 97E-03*	*4 97E-03*	*0.00*
Concentration, ppbvd [b]	*1 39E+00*	*1 39E+00*	*1 39*
Emission Rate, lb/hr [c]	*6 41E-06*	*6.41E-06*	*0 00*
Emission Rate, lb/1000 lb fuel	*1.27E-03*	*3.20E-03*	*0.00*

[a] Milligrams per dry standard cubic meter at 68° F (20° C) and 1 atm.

[b] Parts per billion by volume.

[c] Pounds per hour

POLYNUCLEAR AROMATIC HYDROCARBONS

Summary of Stack Gas Parameters and Test Results
030174.0006.002
Scott AFB Generator Testing
PAH Method 5515

	RUN NUMBER	***PAH-1 (-86)***	***PAH-2 (MF2)***	
	RUN DATE	***09/08/03 - 09/10/03***	***9/10/2003***	***Average***
	RUN TIME	***Composite***	***1325 - 1425***	
	MEASURED DATA			
P_{static}	Stack Static Pressure, inches H_2O	5.22 ✓	0.01	2.62
y	Meter Box Correction Factor	1.273 ✓	1.273	1.273
P_{bar}	Barometric Pressure, inches Hg	30.65 ✓	30.68	30.67
V_m	Sample Volume, L^3	11.780 ✓	16.150	13.965
$Dp^{1/2}$	Average Square Root Dp, (in $H_2O)^{1/2}$	1.4267 ✓	0.1039	0.7653
T_m	Average Meter Temperature, °F	78 ✓	101	90
T_s	Average Stack Temperature, °F	548 ✓	263	406
CO_2	Carbon Dioxide content, % by volume	5.0 ✓	4.2	4.6
O_2	Oxygen content, % by volume	14.7 ✓	15.1	14.9
N_2	Nitrogen content, % by volume	80.3	80.7	80.5
C_p	Pitot Tube Coefficient	0.99 ✓	0.99	0.99
	Circular Stack? 1=Y,0=N:	1	1	
As	Diameter or Dimensions, inches	4.00 ✓	4.00	4.00
F	Fuel Flow, lb/hr	5.04	2.00	
Q	Sample Run Duration, minutes	50 ✓	60	55
	CALCULATED DATA			
$V_{m(std)}$	Standard Meter Volume,L^3	15.072	19.858	17.465
$V_{m(std)}$	Standard Meter Volume,ft^3	0.532	0.701	0.617
P_s	Stack Pressure, inches Hg	31.03	30.68	30.86
B_{ws}	Moisture, % by volume	5.1	5.4	5.2
$1-B_{ws}$	Dry Mole Fraction	0.949	0.946	0.948
M_d	Molecular Weight (d.b.), lb/lb•mole	29.39	29.27	29.33
M_s	Molecular Weight (w.b.), lb/lb•mole	28.81	28.66	28.74
V_s	Stack Gas Velocity, ft/s	128.2	8.0	68.1
A	Stack Area, ft^2	0.1	0.1	0.09
Q_a	Stack Gas Volumetric flow, acfm	672	42	357
Q_s	Stack Gas Volumetric flow, dscfm	344	30	187
Q_s	Stack Gas Volumetric flow, dscmm	10	1	5

✓ PKM 10/21/03

Summary of Stack Gas Parameters and Test Results
030174.0006.002
Scott AFB Generator Testing
PAH Method 5515

	RUN NUMBER	PAH-1 (-86)	PAH-2 (MF2)	
	RUN DATE	09/08/03 - 09/10/03	9/10/2003	Average
	RUN TIME	Composite	1325 - 1425	
	EMISSIONS DATA			
	Naphthalene			
	Analysis, u g/sample	2.0	2.0	2.0
	Molecular Weight, MW	128.2	128.2	128.2
	Concentration, lb/dscf	8.27E-09	6.28E-09	0.0
ppmdv	Parts Per Million, Wet Basis	2.48E-02	1.89E-02	2.19E-02
	Parts Per Million, Dry Basis	2.62E-02	1.99E-02	2.31E-02
	Emission Rate, lb/hr	1.80E-04	1.19E-05	9.59E-05
	Emission Rate, lb/1000 lb fuel	3.56E-02	5.97E-03	2.08E-02
	2-Methylnaphthalene			
	Analysis, u g/sample	2.0	2 0	2.0
	Molecular Weight, MW	142.2	142.2	142.2
	Concentration, lb/dscf	8.27E-09	6.28E-09	0.0
ppmdv	Parts Per Million, Dry Basis	2.24E-02	1.70E-02	1.97E-02
	Parts Per Million, Dry Basis	2.36E-02	1.80E-02	2.08E-02
	Emission Rate, lb/hr	1.80E-04	1.19E-05	9.59E-05
	Emission Rate, lb/1000 lb fuel	3.56E-02	5.97E-03	2.08E-02
	2-Chloronaphthalene			
	Analysis, u g/sample	2.0	2.0	2.0
	Molecular Weight, MW	162.6	162.6	162.6
	Concentration, lb/dscf	8.27E-09	6.28E-09	0.0
ppmdv	Parts Per Million, Wet Basis	1.96E-02	1.49E-02	1.72E-02
	Parts Per Million, Dry Basis	2.06E-02	1.57E-02	1.82E-02
	Emission Rate, lb/hr	1.80E-04	1.19E-05	9.59E-05
	Emission Rate, lb/1000 lb fuel	3.56E-02	5 97E-03	2.08E-02
	Acenaphthene			
	Analysis, u g/sample	2 0	2.0	2.0
	Molecular Weight, MW	154.2	154.2	154.2
	Concentration, lb/dscf	8.27E-09	6.28E-09	0.0
ppmdv	Parts Per Million, Dry Basis	2.07E-02	1.57E-02	1.82E-02
	Parts Per Million, Dry Basis	2.18E-02	1.66E-02	1.92E-02
	Emission Rate, lb/hr	1.80E-04	1.19E-05	9.59E-05
	Emission Rate, lb/1000 lb fuel	3.56E-02	5 97E-03	2.08E-02
	Acenaphthylene			
	Analysis, u g/sample	2 0	2 0	2.0
	Molecular Weight, MW	152.2	152.2	152.2
	Concentration, lb/dscf	8.27E-09	6.28E-09	0.0
ppmdv	Parts Per Million, Wet Basis	2.09E-02	1.59E-02	1.84E-02
	Parts Per Million, Dry Basis	2.20E-02	1.68E-02	1.94E-02
	Emission Rate, lb/hr	1.80E-04	1.19E-05	9.59E-05
	Emission Rate, lb/1000 lb fuel	3 56E-02	5.97E-03	2.08E-02

Summary of Stack Gas Parameters and Test Results
030174.0006.002
Scott AFB Generator Testing
PAH Method 5515

	RUN NUMBER	PAH-1 (-86)	PAH-2 (MF2)	
	RUN DATE	09/08/03 - 09/10/03	9/10/2003	Average
	RUN TIME	Composite	1325 - 1425	
	Fluorene			
	Analysis, ug/sample	2.0	2 0	2.0
	Molecular Weight, MW	166.2	166.2	166.2
	Concentration, lb/dscf	8.27E-09	6.28E-09	0.0
ppmdv	Parts Per Million, Dry Basis	1.92E-02	1.45E-02	1.69E-02
	Parts Per Million, Dry Basis	2.02E-02	1.54E-02	1.78E-02
	Emission Rate, lb/hr	1.80E-04	1.19E-05	9.59E-05
	Emission Rate, lb/1000 lb fuel	3 56E-02	5.97E-03	2.08E-02
	Phenanthrene			
	Analysis, ug/sample	2 0	2.0	2.0
	Molecular Weight, MW	178.0	178.0	178.0
	Concentration, lb/dscf	8.27E-09	6.28E-09	0.0
ppmdv	Parts Per Million, Dry Basis	1.79E-02	1.36E-02	1.57E-02
	Parts Per Million, Dry Basis	1.89E-02	1.44E-02	1.66E-02
	Emission Rate, lb/hr	1.80E-04	1.19E-05	9.59E-05
	Emission Rate, lb/1000 lb fuel	3 56E-02	5 97E-03	2.08E-02
	Anthracene			
	Analysis, ug/sample	2 0	2 0	2.0
	Molecular Weight, MW	178.2	178.2	178.2
	Concentration, lb/dscf	8.27E-09	6.28E-09	0.0
ppmdv	Parts Per Million, Dry Basis	1.79E-02	1.36E-02	1.57E-02
	Parts Per Million, Dry Basis	1.88E-02	1.43E-02	1.66E-02
	Emission Rate, lb/hr	1.80E-04	1.19E-05	9.59E-05
	Emission Rate, lb/1000 lb fuel	3 56E-02	5 97E-03	2.08E-02
	Fluoranthene			
	Analysis, ug/sample	2 0	2 0	2.0
	Molecular Weight, MW	202.3	202.3	202.3
	Concentration, lb/dscf	8.27E-09	6.28E-09	0.0
ppmdv	Parts Per Million, Dry Basis	1.57E-02	1.20E-02	1.38E-02
	Parts Per Million, Dry Basis	1.66E-02	1.26E-02	1.46E-02
	Emission Rate, lb/hr	1.80E-04	1.19E-05	9.59E-05
	Emission Rate, lb/1000 lb fuel	3 56E-02	5.97E-03	2.08E-02
	Pyrene			
	Analysis, ug/sample	2.0	2.0	2.0
	Molecular Weight, MW	202.3	202.3	202.3
	Concentration, lb/dscf	8.27E-09	6.28E-09	0.0
ppmdv	Parts Per Million, Dry Basis	1.57E-02	1.20E-02	1.38E-02
	Parts Per Million, Dry Basis	1.66E-02	1.26E-02	1.46E-02
	Emission Rate, lb/hr	1.80E-04	1.19E-05	9.59E-05
	Emission Rate, lb/1000 lb fuel	3.56E-02	5 97E-03	2.08E-02

Summary of Stack Gas Parameters and Test Results
030174.0006.002
Scott AFB Generator Testing
PAH Method 5515

	RUN NUMBER	PAH-1 (-86)	PAH-2 (MF2)	
	RUN DATE	09/08/03 - 09/10/03	9/10/2003	Average
	RUN TIME	Composite	1325 - 1425	
	Chrysene			
	Analysis, ug/sample	2.0	2.0	2.0
	Molecular Weight, MW	228.3	228.3	228.3
	Concentration, lb/dscf	8.27E-09	6.28E-09	0.0
ppmdv	Parts Per Million, Dry Basis	1.40E-02	1.06E-02	1.23E-02
	Parts Per Million, Dry Basis	1.47E-02	1.12E-02	1.29E-02
	Emission Rate, lb/hr	1.80E-04	1.19E-05	9.59E-05
	Emission Rate, lb/1000 lb fuel	3 56E-02	5.97E-03	2.08E-02
	Benzo(a)anthracene			
	Analysis, ug/sample	2 0	2 0	2.0
	Molecular Weight, MW	228.3	228.3	228.3
	Concentration, lb/dscf	8.27E-09	6.28E-09	0.0
ppmdv	Parts Per Million, Dry Basis	1.40E-02	1.06E-02	1.23E-02
	Parts Per Million, Dry Basis	1.47E-02	1.12E-02	1.29E-02
	Emission Rate, lb/hr	1.80E-04	1.19E-05	9.59E-05
	Emission Rate, lb/1000 lb fuel	3.56E-02	5 97E-03	2.08E-02
	Benzo(b)fluoranthene			
	Analysis, ug/sample	2.0	2 0	2.0
	Molecular Weight, MW	252.3	252.3	252.3
	Concentration, lb/dscf	8.27E-09	6.28E-09	0.0
ppmdv	Parts Per Million, Dry Basis	1.26E-02	9.58E-03	1.11E-02
	Parts Per Million, Dry Basis	1.33E-02	1.01E-02	1.17E-02
	Emission Rate, lb/hr	1.80E-04	1.19E-05	9.59E-05
	Emission Rate, lb/1000 lb fuel	3 56E-02	5 97E-03	2.08E-02
	Benzo(k)fluoranthene			
	Analysis, ug/sample	2 0	2.0	2.0
	Molecular Weight, MW	252.3	252.3	252.3
	Concentration, lb/dscf	8.27E-09	6.28E-09	0.0
ppmdv	Parts Per Million, Dry Basis	1.26E-02	9.58E-03	1.11E-02
	Parts Per Million, Dry Basis	1.33E-02	1.01E-02	1.17E-02
	Emission Rate, lb/hr	1.80E-04	1.19E-05	9.59E-05
	Emission Rate, lb/1000 lb fuel	3.56E-02	5.97E-03	2.08E-02
	Benzo(a)pyrene			
	Analysis, ug/sample	2.0	2.0	2.0
	Molecular Weight, MW	252.3	252.3	252.3
	Concentration, lb/dscf	8.27E-09	6.28E-09	0.0
ppmdv	Parts Per Million, Dry Basis	1.26E-02	9.58E-03	1.11E-02
	Parts Per Million, Dry Basis	1.33E-02	1.01E-02	1.17E-02
	Emission Rate, lb/hr	1.80E-04	1.19E-05	9.59E-05
	Emission Rate, lb/1000 lb fuel	3 56E-02	5.97E-03	2.08E-02

Summary of Stack Gas Parameters and Test Results
030174.0006.002
Scott AFB Generator Testing
PAH Method 5515

	RUN NUMBER	*PAH-1 (-86)*	*PAH-2 (MF2)*	
	RUN DATE	*09/08/03 - 09/10/03*	*9/10/2003*	Average
	RUN TIME	*Composite*	*1325 - 1425*	
	Indeno(1,2,3-c,d)pyrene			
	Analysis, ug/sample	2 0	2 0	2.0
	Molecular Weight, MW	276.3	276.3	276.3
	Concentration, lb/dscf	8.27E-09	6.28E-09	0.0
ppmdv	**Parts Per Million, Dry Basis**	1.15E-02	8.75E-03	1.01E-02
	Parts Per Million, Dry Basis	1.21E-02	9.25E-03	1.07E-02
	Emission Rate, lb/hr	1.80E-04	1.19E-05	9.59E-05
	Emission Rate, lb/1000 lb fuel	3.56E-02	5 97E-03	2.08E-02
	Dibenz(a,h)anthracene			
	Analysis, ug/sample	2 0	2.0	2.0
	Molecular Weight, MW	278.4	278.4	278.4
	Concentration, lb/dscf	8.27E-09	6.28E-09	0.0
ppmdv	**Parts Per Million, Dry Basis**	1.14E-02	8.68E-03	1.01E-02
	Parts Per Million, Dry Basis	1.21E-02	9.18E-03	1.06E-02
	Emission Rate, lb/hr	1.80E-04	1.19E-05	9.59E-05
	Emission Rate, lb/1000 lb fuel	3.56E-02	5.97E-03	2.08E-02
	Benzo(g,h,i,perylene)			
	Analysis, ug/sample	2.0	2.0	2.0
	Molecular Weight, MW	276.3	276.3	276.3
	Concentration, lb/dscf	8.27E-09	6.28E-09	0.0
ppmdv	**Parts Per Million, Dry Basis**	1.15E-02	8.75E-03	1.01E-02
	Parts Per Million, Dry Basis	1.21E-02	9.25E-03	1.07E-02
	Emission Rate, lb/hr	1.80E-04	1.19E-05	9.59E-05
	Emission Rate, lb/1000 lb fuel	3.56E-02	5.97E-03	2.08E-02

Run 5515-1 and 5515-2 had a Rpt. Limit of 2 0; If ND result is shown in italics

ALDEHYDE/KETONES

Summary of Stack Gas Parameters and Test Results
030174.006.0002
Scott AFB Generator Testing
Aldehyde/Ketones - Test Method 0011

	RUN NUMBER	***0011-1 (-86)***	***0011-2 (MF2)***	
	RUN DATE	***09/08/03 - 09/10/03***	***9/10/2003***	***Average***
	RUN TIME	***Composite***	***1325 - 1425***	
	MEASURED DATA			
P_{static}	Stack Static Pressure, inches H_2O	5 22 ✓	0.01 ✓	2 62
y	Meter Box Correction Factor	1 003 ✓	1 003 ✓	1 003
P_{bar}	Barometric Pressure, inches Hg	30.65 ✓	30.68 ✓	30 67
V_m	Sample Volume, ft^3	34.396 ✓	29.420 ✓	31 908
$Dp^{1/2}$	Average Square Root Dp, (in $H_2O)^{1/2}$	1.4267 ✓	0 1039 ✓	0 7653
DH	Avg Meter Orifice Pressure, in H_2O	1 85	0 63	1 24
T_m	Average Meter Temperature, °F	77	99	88
T_s	Average Stack Temperature, °F	548	263	406
V_{lc}	Condensate Collected, ml	46.7	34 5	40 6
CO_2	Carbon Dioxide content, % by volume	5.0	4 2	4.6
O_2	Oxygen content, % by volume	14 7	15 1	14 9
N_2	Nitrogen content, % by volume	80.3	80 7	80 5
C_p	Pitot Tube Coefficient	0.99	0 99	0 99
	Circular Stack? 1=Y,0=N	1	1	
As	Diameter or Dimensions, inches	4.00	4.00	4 00
F	Fuel Flow, lb/hr	5.04	2.00	
Q	Sample Run Duration, minutes	50	60	55
D_n	Nozzle Diameter, inches	0.193	0 500	0.347
	CALCULATED DATA			
A_n	Nozzle Area, ft^2	0 000203	0 001363	0.000783
$V_{m(std)}$	Standard Meter Volume, ft^3	34.909	28 627	31.768
$V_{m(std)}$	Standard Meter Volume, m^3	0 989	0 811	0.900
Q_m	Average Sampling Rate, dscfm	0 698	0.477	0.588
P_s	Stack Pressure, inches Hg	31.03	30.68	30.86
B_{ws}	Moisture, % by volume	5 9	5.4	5 6
$B_{ws(sat)}$	Moisture (at saturation), % by volume	7086.4	248.8	3667.6
V_{wstd}	Standard Water Vapor Volume, ft^3	2.198	1 624	1.911
$1\text{-}B_{ws}$	Dry Mole Fraction	0.941	0.946	0.944
M_d	Molecular Weight (d b), lb/lb•mole	29 39	29 27	29.33
M_s	Molecular Weight (w.b.), lb/lb•mole	28.71	28.67	28.69
V_s	Stack Gas Velocity, ft/s	128.4	8.0	68.2
A	Stack Area, ft^2	0.1	0.1	0.09
Q_a	Stack Gas Volumetric flow, acfm	672 ✓	42 ✓	357
Q_s	Stack Gas Volumetric flow, dscfm	344 ✓	30 ✓	187
Q_s	Stack Gas Volumetric flow, dscmm	10	1	5
I	Isokinetic Sampling Ratio, %	87.3	103.3	95.3

Summary of Stack Gas Parameters and Test Results
030174.006.0002
Scott AFB Generator Testing
Aldehyde/Ketones - Test Method 0011

	RUN NUMBER	***0011-1 (-86)***	***0011-2 (MF2)***	
	RUN DATE	***09/08/03 - 09/10/03***	***09/10/03***	***Average***
	RUN TIME	***Composite***	***1325 - 1425***	
	EMISSIONS DATA			
HCHO	Formaldehyde			
	Target Catch, µg	800	3800	2300.0
	Concentration, µg/dscm	809.31	4687.75	2748 53
	Emission Rate, lb/hr	1 04E-03	5 18E-04	7 79E-04
	Emission Rate, lb/1000 lb fuel	2 06E-01	2.59E-01	2 33E-01
CH_3CHO	Acetaldehyde			
	Target Catch, µg	750	1200	975.0
	Concentration, µg/dscm	758.72	1480.34	1119.53
	Emission Rate, lb/hr	9.74E-04	1 64E-04	5 69E-04
	Emission Rate, lb/1000 lb fuel	1 93E-01	8 18E-02	1 37E-01
CH_2CHCHO	Acrolein			
	Target Catch, µg	*26*	560	293 00
	Concentration, µg/dscm	*26.30*	690.83	358.56
	Emission Rate, lb/hr	*3.38E-05*	7 64E-05	5.51E-05
	Emission Rate, lb/1000 lb fuel	*6.70E-03*	3.82E-02	2 24E-02
$CH_3CH_2CH_2OH$	Propanal			
	Target Catch, µg	*26*	240	133.0
	Concentration, µg/dscm	*26 3*	296.1	161.2
	Emission Rate, lb/hr	*3 38E-05*	3.27E-05	3 33E-05
	Emission Rate, lb/1000 lb fuel	*6.70E-03*	1 64E-02	1.15E-02
$CH_3CHCHCHO$	Crotonaldehyde			
	Target Catch, µg	90	260	175.00
	Concentration, µg/dscm	91.05	320.74	205 89
	Emission Rate, lb/hr	1.17E-04	3 55E-05	7.62E-05
	Emission Rate, lb/1000 lb fuel	2 32E-02	1.77E-02	2.05E-02
$CH_3COC_5H_{11}$	Methyl Ethyl Ketone/Butyraldehydes			
	Target Catch, µg	*26*	260	143 0
	Concentration, µg/dscm	*26 3*	320.7	173.5
	Emission Rate, lb/hr	*3 38E-05*	3 55E-05	3 46E-05
	Emission Rate, lb/1000 lb fuel	*6.70E-03*	1.77E-02	1 22E-02
C_6H_5CHO	Benzaldehyde			
	Target Catch, µg	*26*	220	123 0
	Concentration, µg/dscm	*26 3*	271.4	148.8
	Emission Rate, lb/hr	*3.38E-05*	3 00E-05	3 19E-05
	Emission Rate, lb/1000 lb fuel	*6.70E-03*	1.50E-02	1 08E-02
$CH_3)_2CHCH_2CHC$	Isopentanal			
	Target Catch, µg	*26*	*110*	*68.0*
	Concentration, µg/dscm	*26 3*	*135.7*	*81.0*
	Emission Rate, lb/hr	*3.38E-05*	*1 50E-05*	*2.44E-05*
	Emission Rate, lb/1000 lb fuel	*6.70E-03*	*7.50E-03*	*7 10E-03*

Summary of Stack Gas Parameters and Test Results
030174.006.0002
Scott AFB Generator Testing
Aldehyde/Ketones - Test Method 0011

	RUN NUMBER RUN DATE RUN TIME	0011-1 (-86) 09/08/03 - 09/10/03 Composite	0011-2 (MF2) 09/10/03 1325 - 1425	Average
	EMISSIONS DATA - Continued			
$CH_3(CH_2)_3CHO$	Pentanal			
	Target Catch, µg	*26*	*110*	*68.0*
	Concentration, µg/dscm	*26 3*	*135.7*	*81 0*
	Emission Rate, lb/hr	*3 38E-05*	*1.50E-05*	*2.44E-05*
	Emission Rate, lb/1000 lb fuel	*6 70E-03*	*7 50E-03*	*7 10E-03*
$C_6H_4CH_3CHO$	o-Tolualdehyde			
	Target Catch, µg	*26*	*110*	*68.0*
	Concentration, µg/dscm	*26 3*	*135.7*	*81 0*
	Emission Rate, lb/hr	*3.38E-05*	*1.50E-05*	*2.44E-05*
	Emission Rate, lb/1000 lb fuel	*6.70E-03*	*7 50E-03*	*7 10E-03*
	m,p-Tolualdehyde			
	Target Catch, µg	*26*	*110*	*68.000*
	Concentration, µg/dscm	*26.3*	*135.7*	*81.000*
	Emission Rate, lb/hr	*3.38E-05*	*1 50E-05*	*2 44E-05*
	Emission Rate, lb/1000 lb fuel	*6.70E-03*	*7.50E-03*	*7.10E-03*
$CH_3(CH_2)_4CHO$	Hexanal			
	Target Catch, µg	*26*	*110*	*68*
	Concentration, µg/dscm	*26.3*	*135.7*	*81.0*
	Emission Rate, lb/hr	*3.38E-05*	*1 50E-05*	*2.44E-05*
	Emission Rate, lb/1000 lb fuel	*6.70E-03*	*7.50E-03*	*7.10E-03*

Run 0011-1 had a Rpt. Limit of 26.0; if ND result is shown in italics. Formaldehyde was present in trip blank; Crotonaldehyde may be biased due to matrix interfe
Run 0011-2 had a Rpt. Limit of 110; if ND result is shown in italics. Formaldehyde was present in trip blank; Benzaldehyde may be biased due to matrix interfere